



**Sacramento
and
San Joaquin
River Basins**

Comprehensive Study

**Existing Hydrodynamic Conditions in the Delta
During Floods
Appendix A – Summary of DSM2 Simulation Results for 1997
Flood, California Department of Water Resources**



**US Army Corps
of Engineers**
Sacramento District

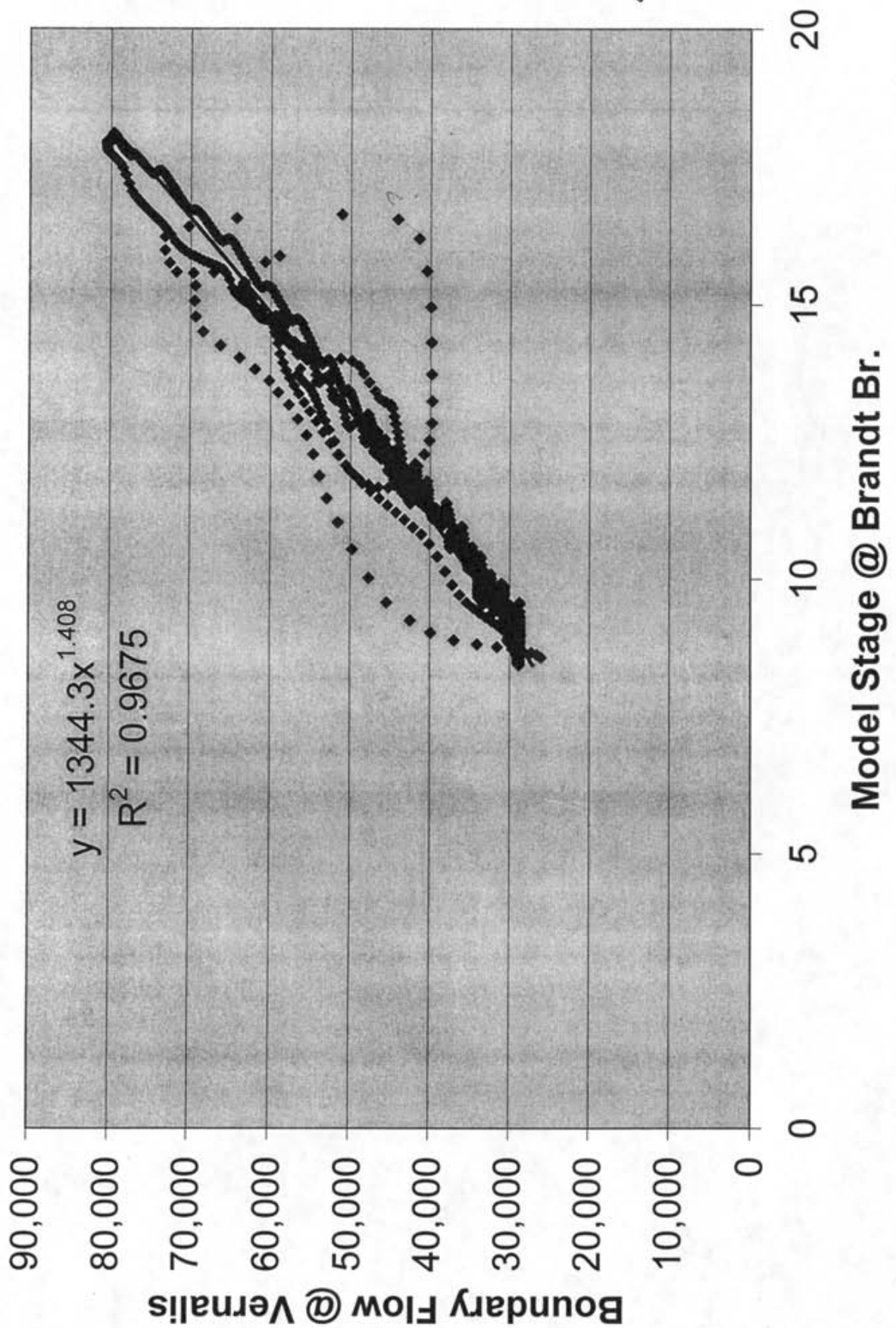
Vernalis Boundary Condition:

A historical model run for the January 1997 flood period was conducted to verify that the current DSM2 calibration was adequate for high flow studies. The boundary conditions for this study were obtained from the Delta Modeling Section (DMS) with exception of data for the Calaveras River, which was provided by the consultant.

The results of the verification revealed an inconsistency in the boundary data for Vernalis. A new query was made to CDEC to obtain current historical data for the verification period. Although the data was different likely due to a rating curve shift after that storm, the subsequent run was still inconsistent. Further analysis was conducted by comparing the historical stage at Vernalis to the Brandt Bridge and Old River Head historical stages. This revealed that the Vernalis data up to approximately Jan. 4 was consistent, the first flood peak, approximately Jan. 5, is too high, and that a third flood wave, approximately Jan. 8, is missing. The stage hydrographs at Brandt and Old R. head are on a sharp rising limb while the Vernalis stage is on a mild receding limb. This inconsistency lead to under-prediction by DSM2 for most location in the South Delta and SJR.

A regression relationship was developed to determine what the flow at Vernalis would need to be for a good match at Brandt. The necessary flow was determined by regressing the boundary condition flow given to the model and the resulting model calculated stage at Brandt. This yielded an equation to predict models behavior at Brandt for a given flow condition at Vernalis. The tidal average of the historical stage at Brandt was then fed to the equation producing the boundary condition flows required. The synthetic boundary condition was then plugged back into the model.

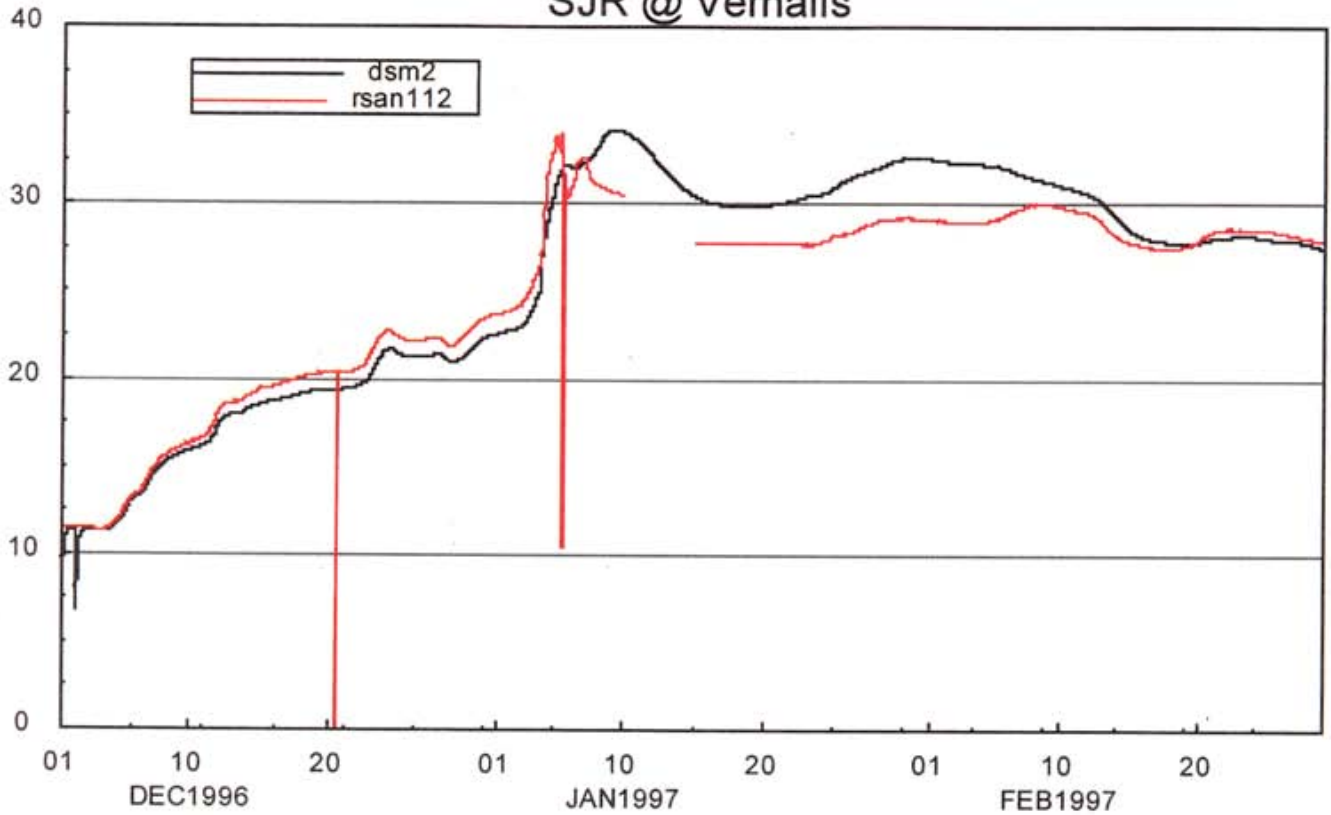
Regression equation used To estimate Vernalis flow based on stage at Brandt Bridge. This equation is only Suitable for high flow.



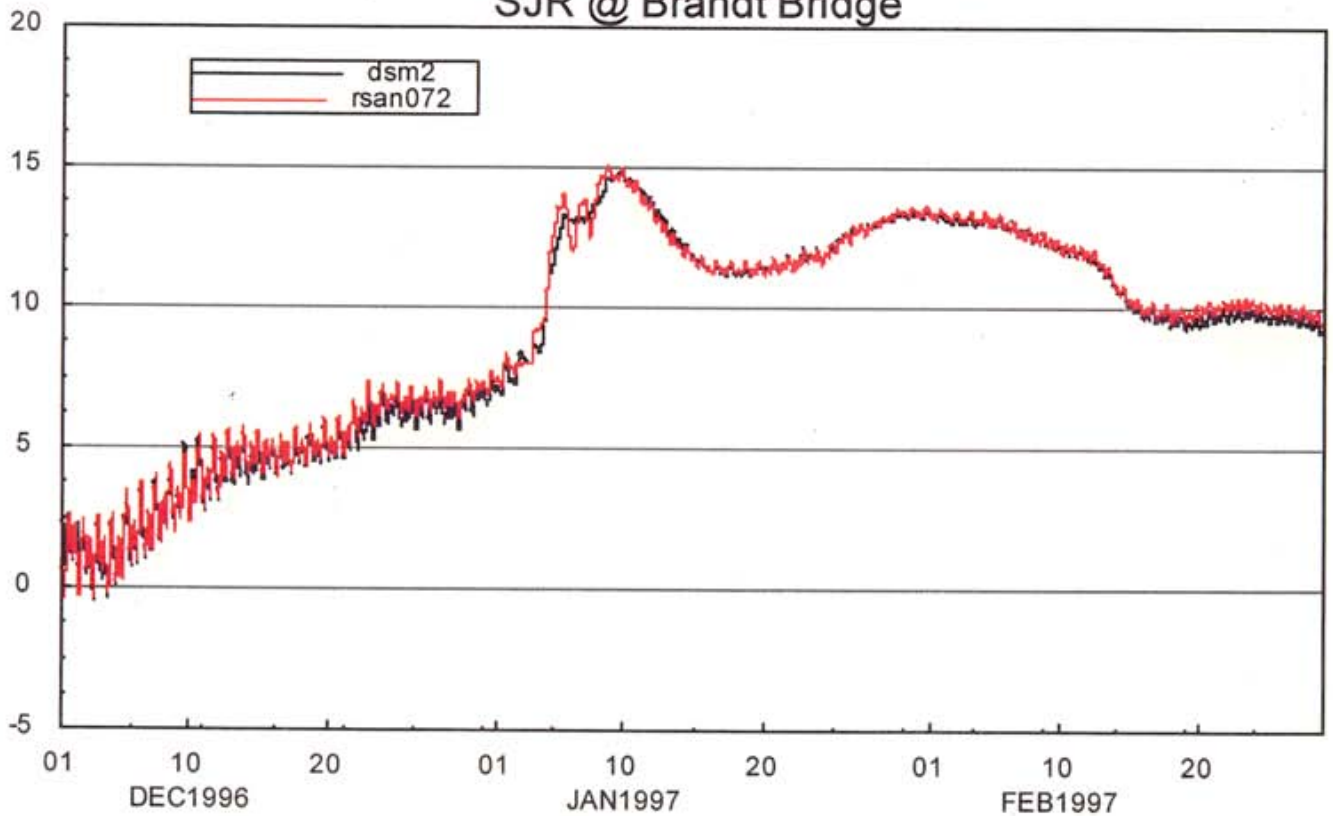
Vernalis Flow adjusted from Jan 4 onward.

Flood-SJR Stage Calibration

SJR @ Vernalis

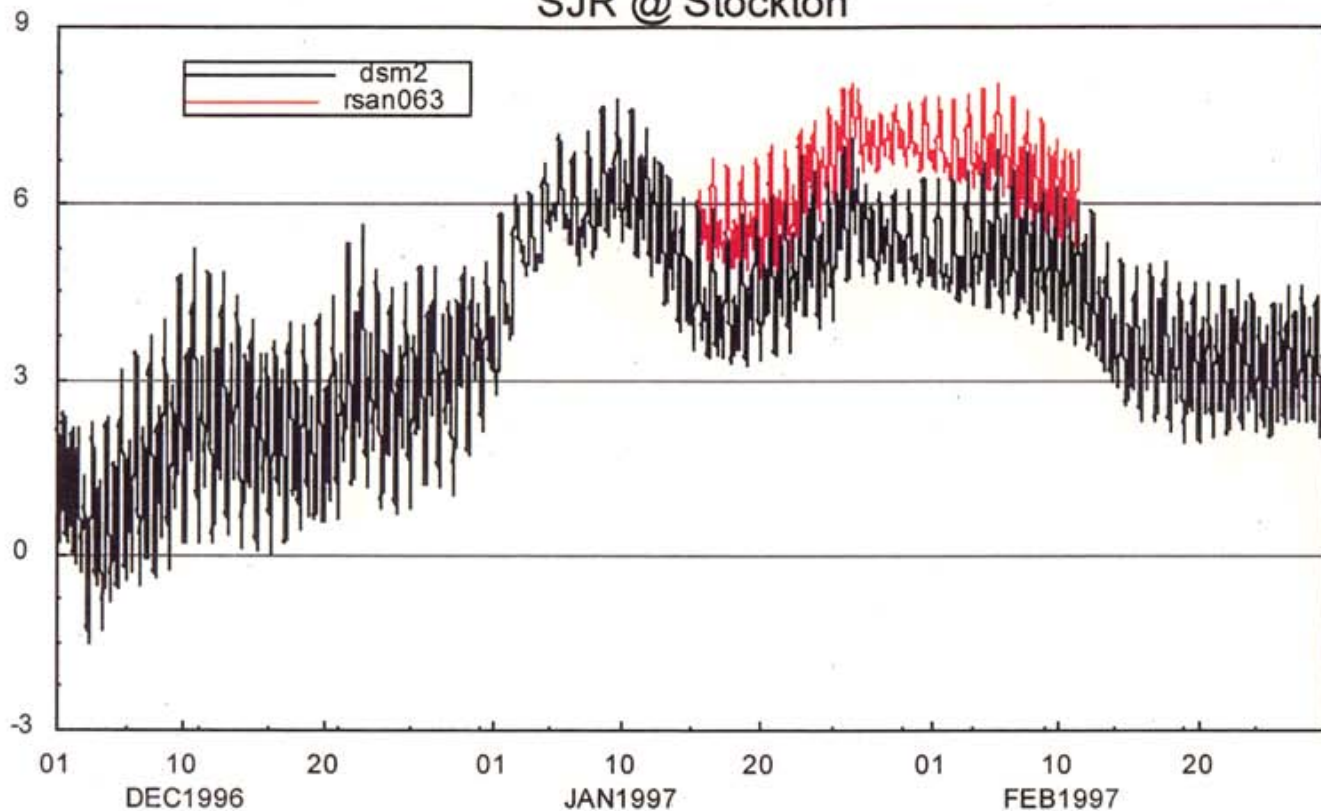


SJR @ Brandt Bridge

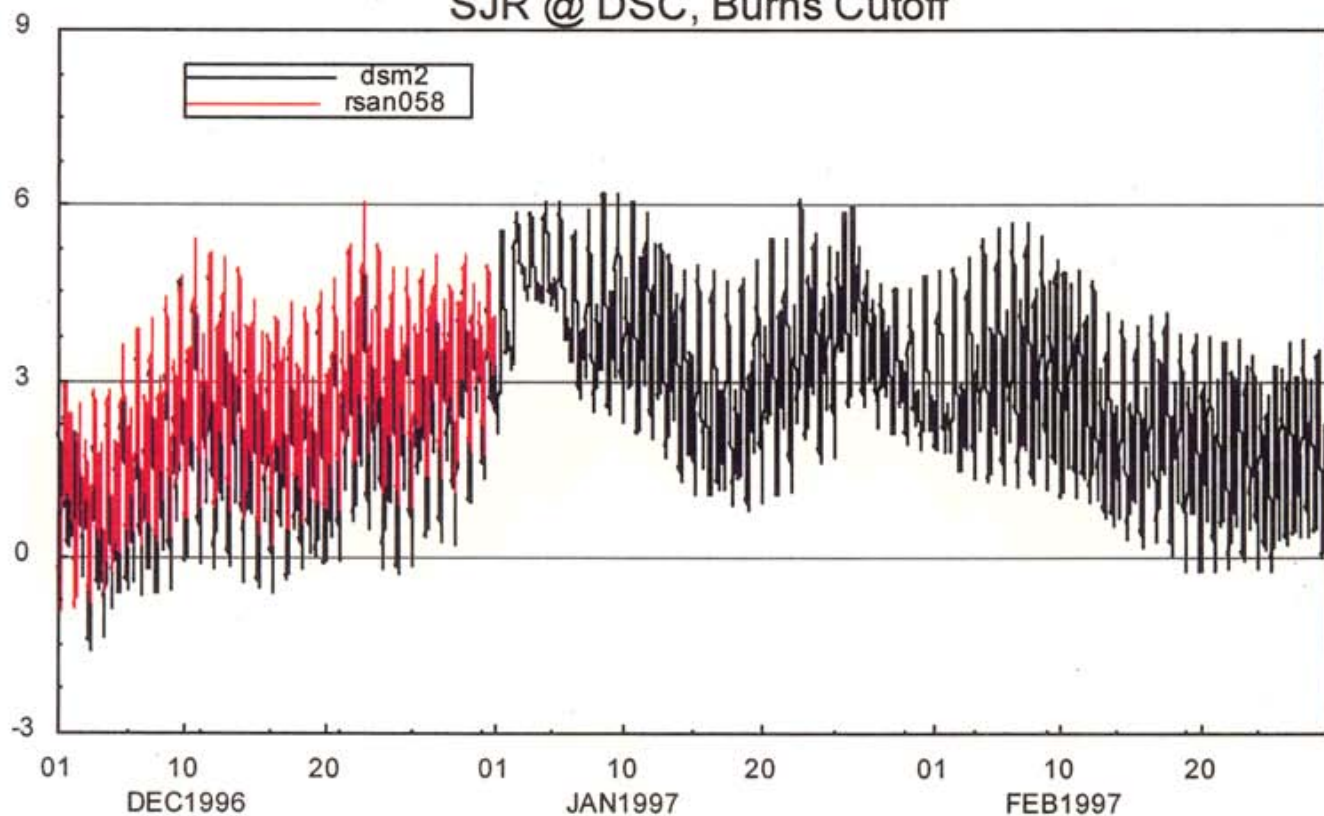


Flood-SJR Stage Calibration

SJR @ Stockton

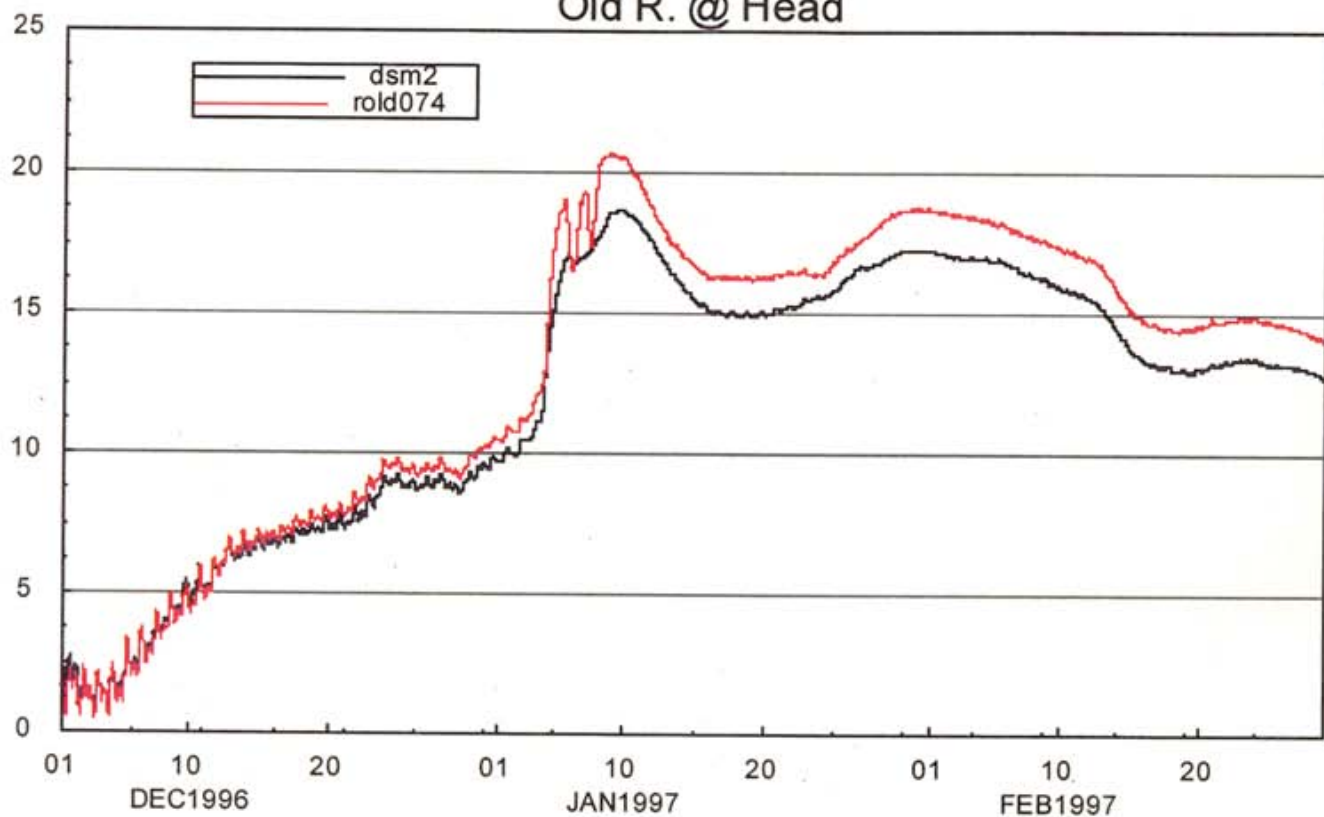


SJR @ DSC, Burns Cutoff

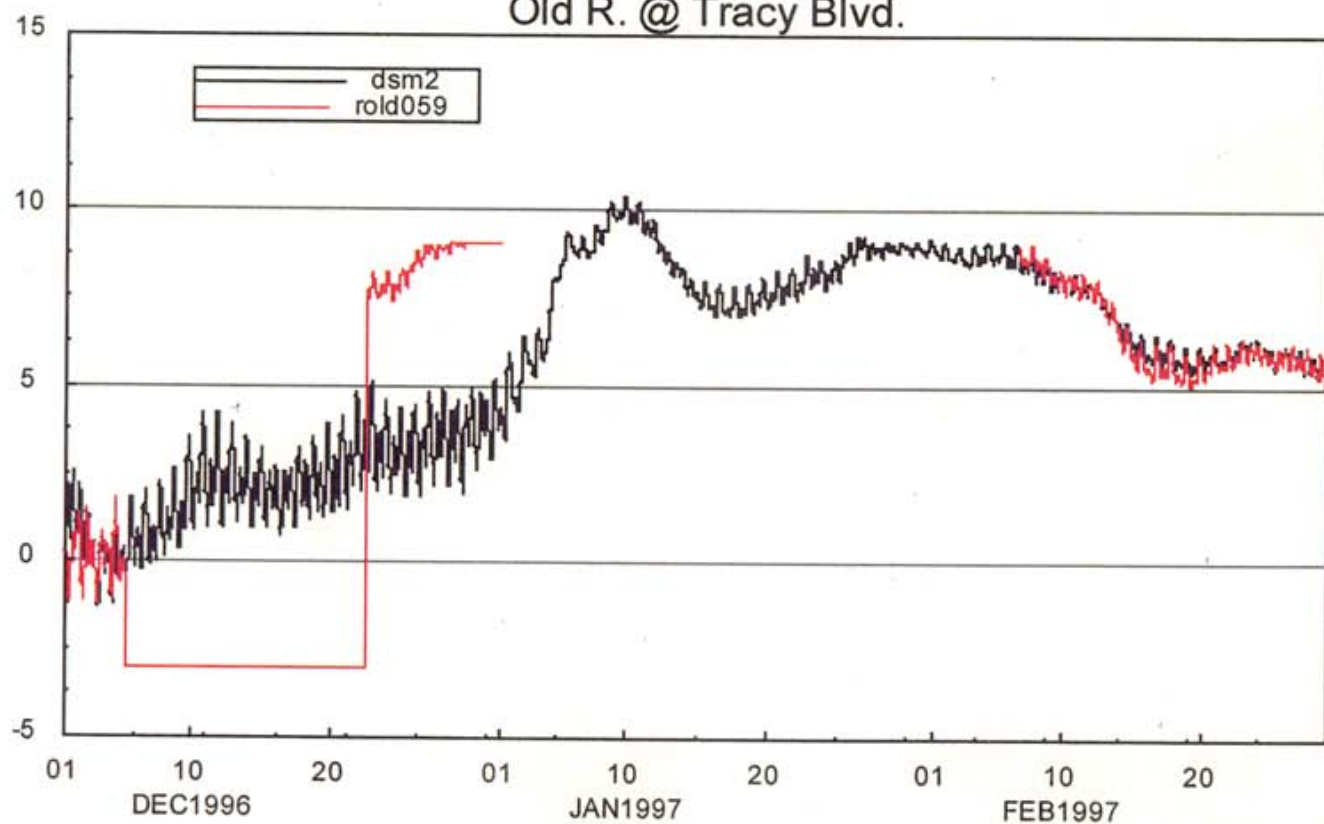


Flood-SJR Stage Calibration

Old R. @ Head

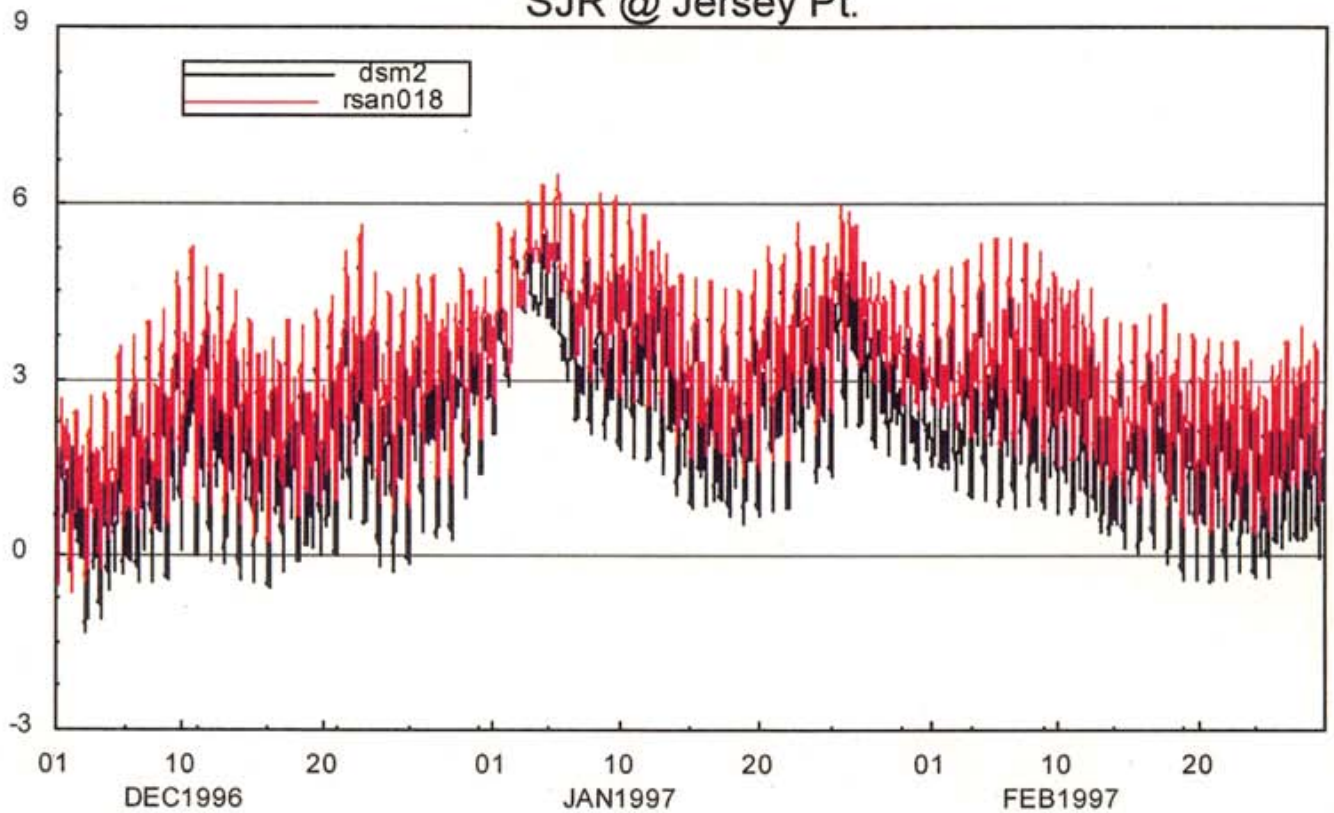


Old R. @ Tracy Blvd.

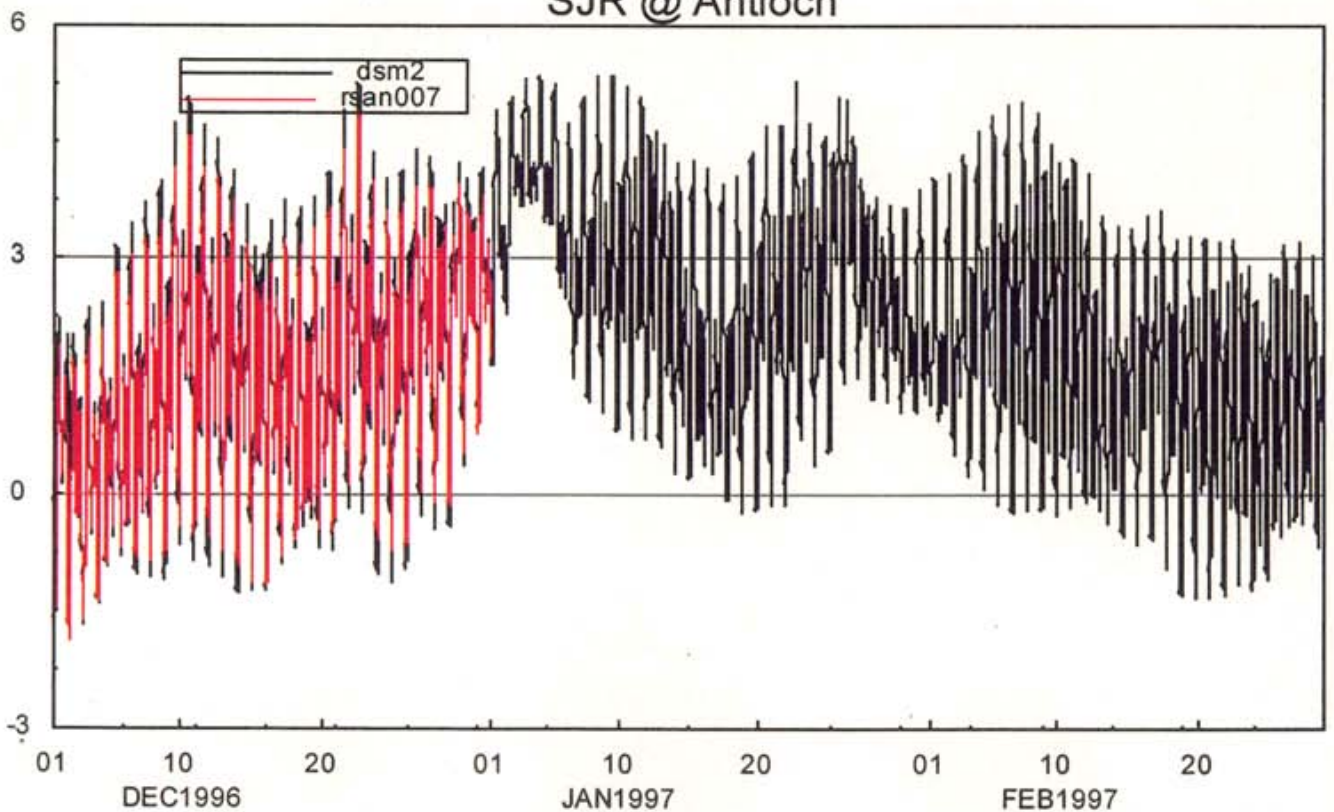


Flood-SJR Stage Calibration

SJR @ Jersey Pt.

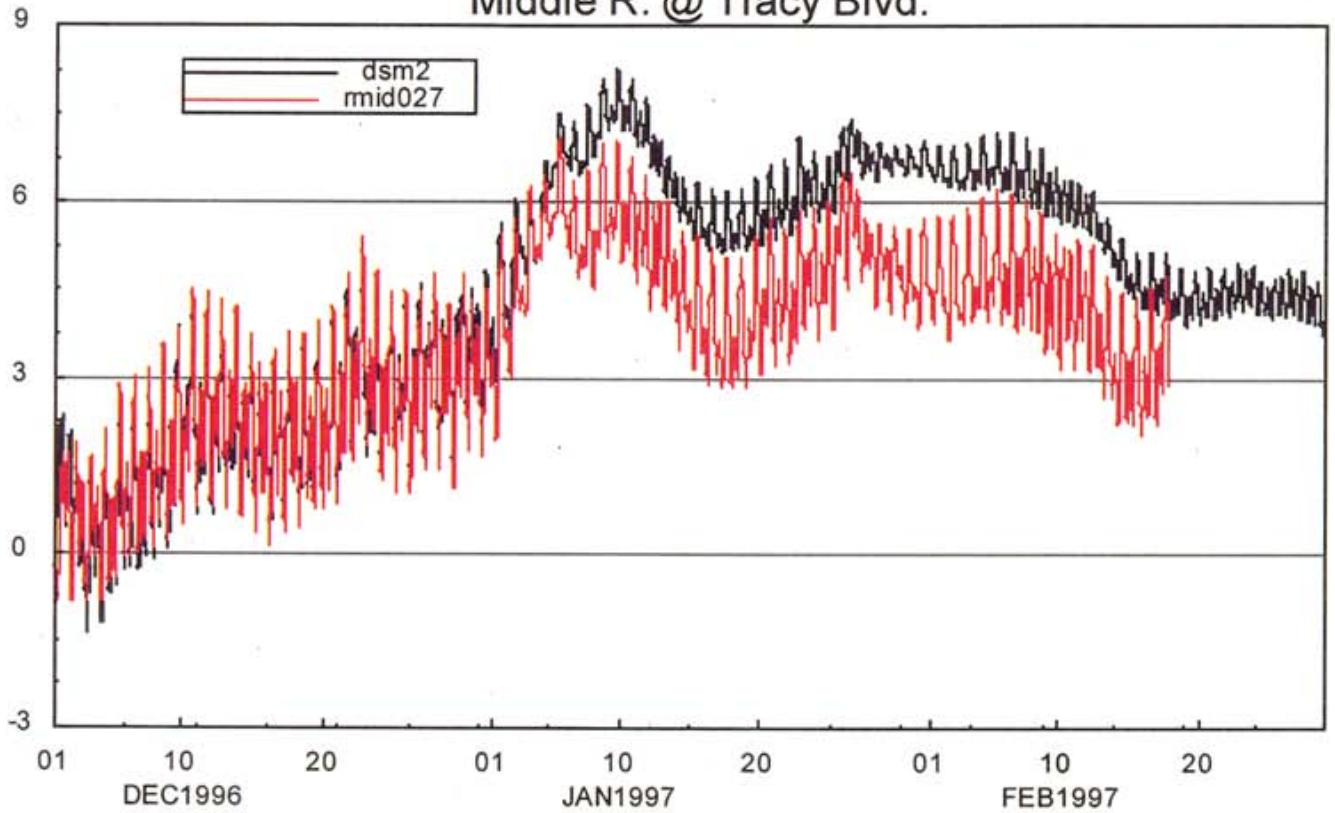


SJR @ Antioch

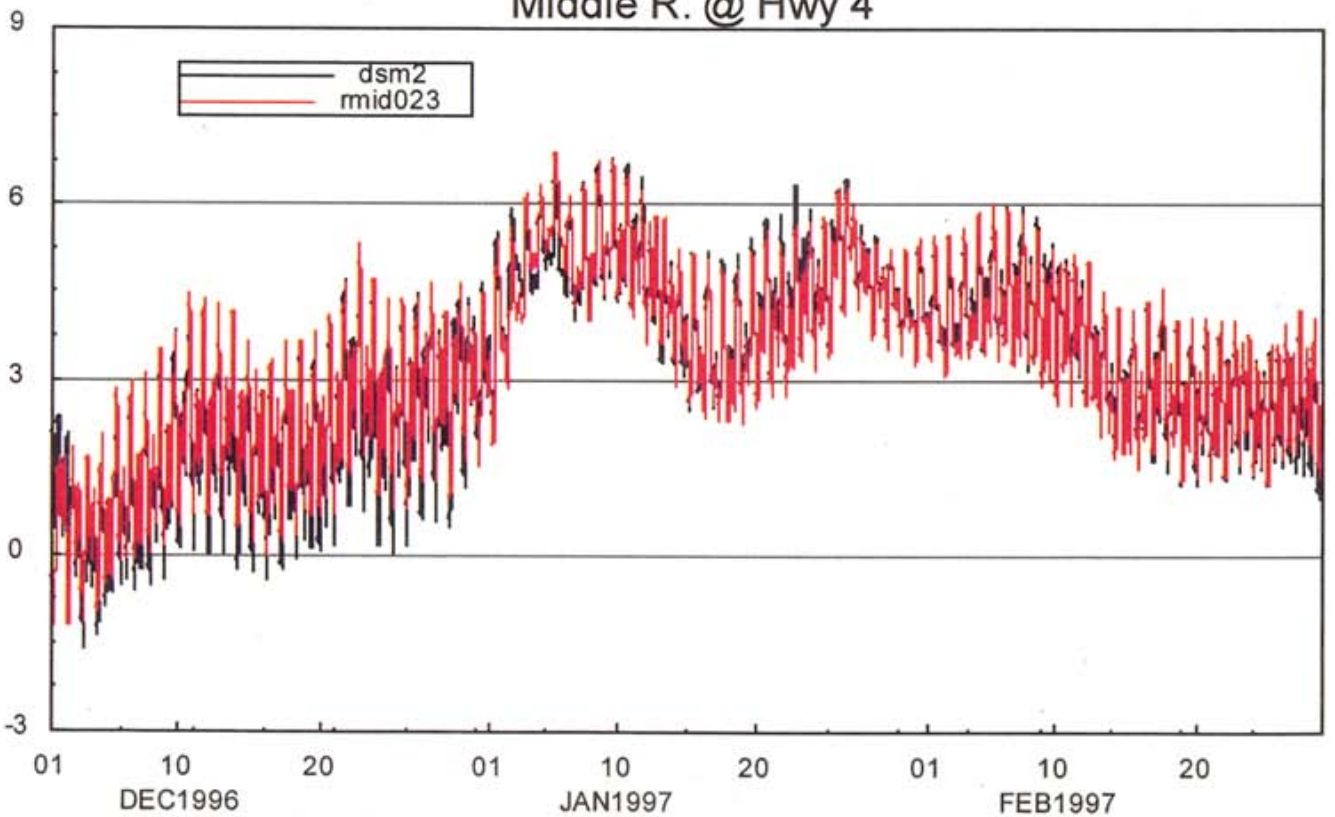


Flood-SJR Stage Calibration

Middle R. @ Tracy Blvd.

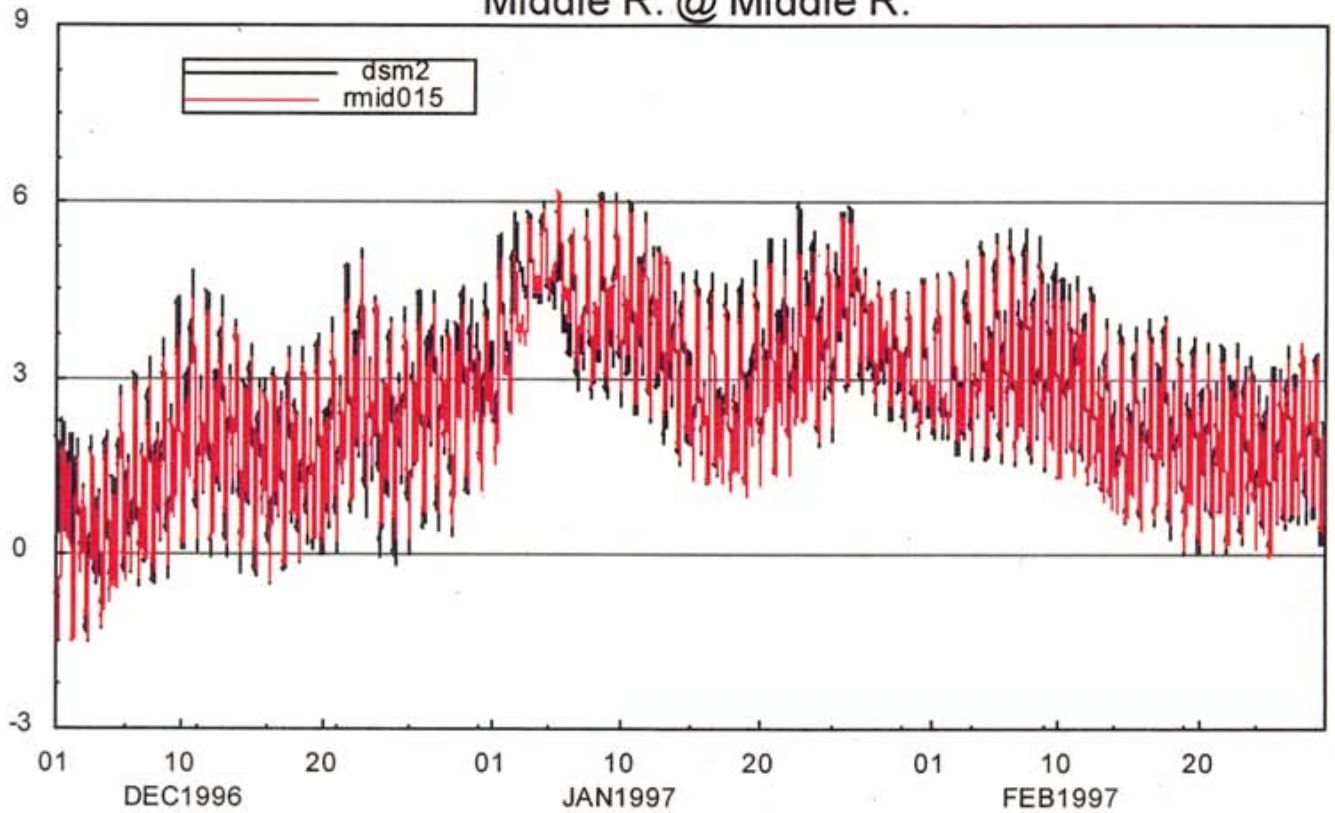


Middle R. @ Hwy 4

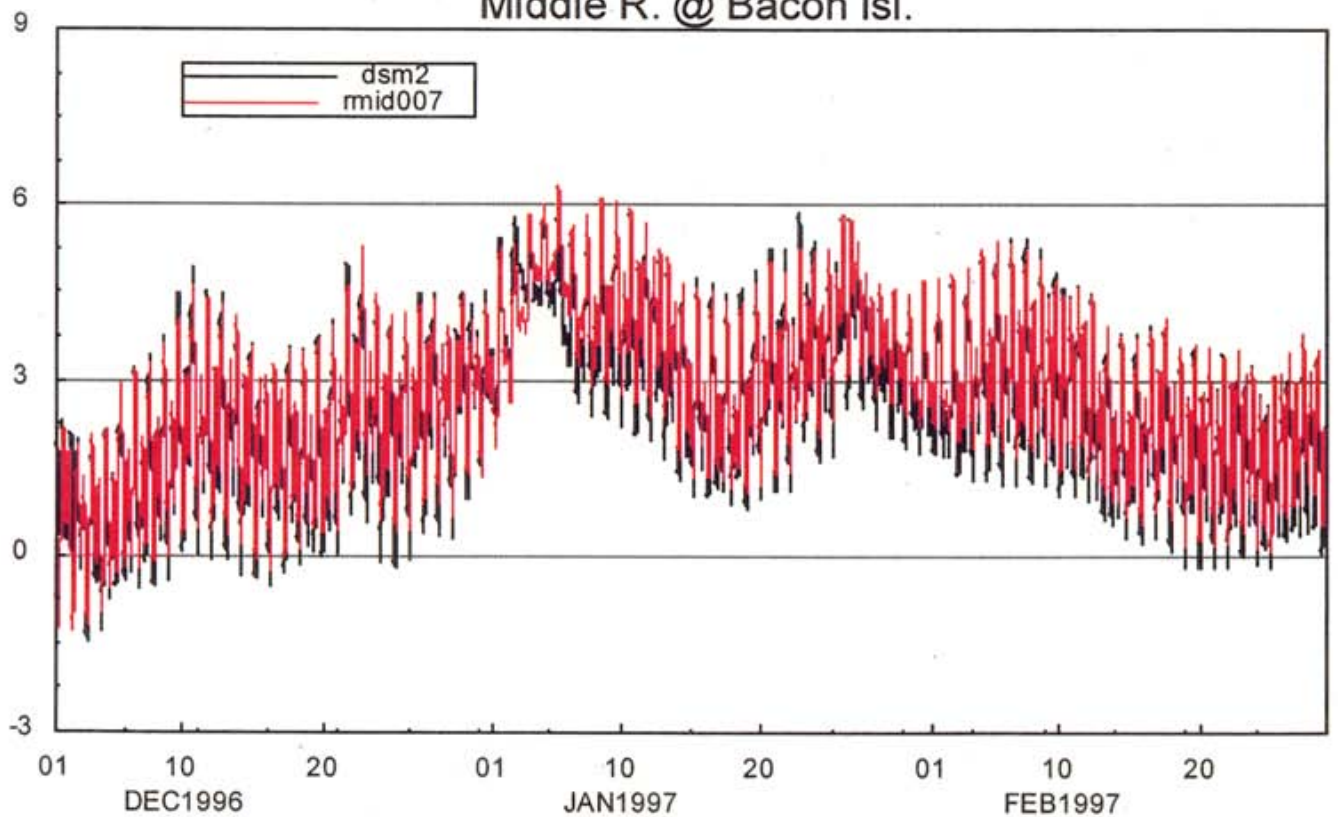


Flood-SJR Stage Calibration

Middle R. @ Middle R.

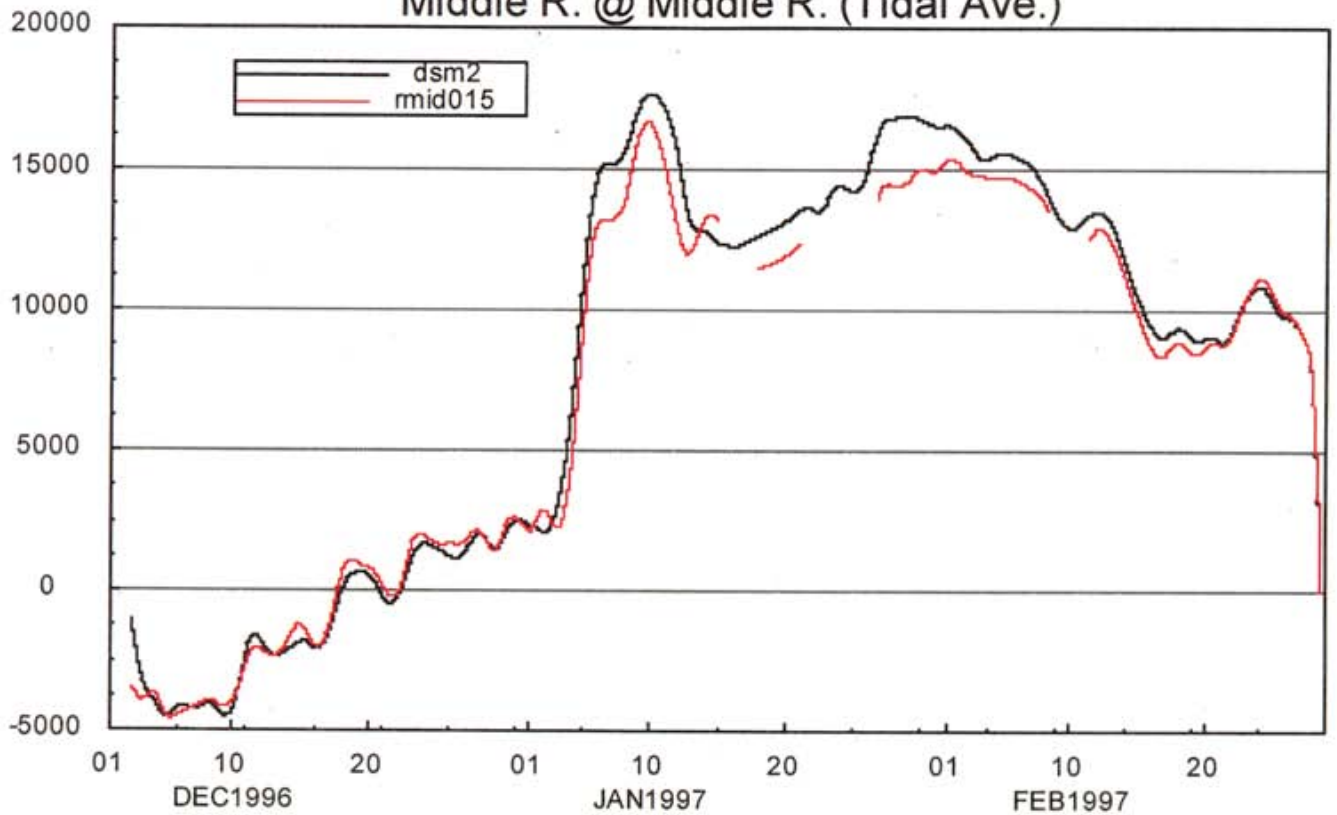


Middle R. @ Bacon Isl.

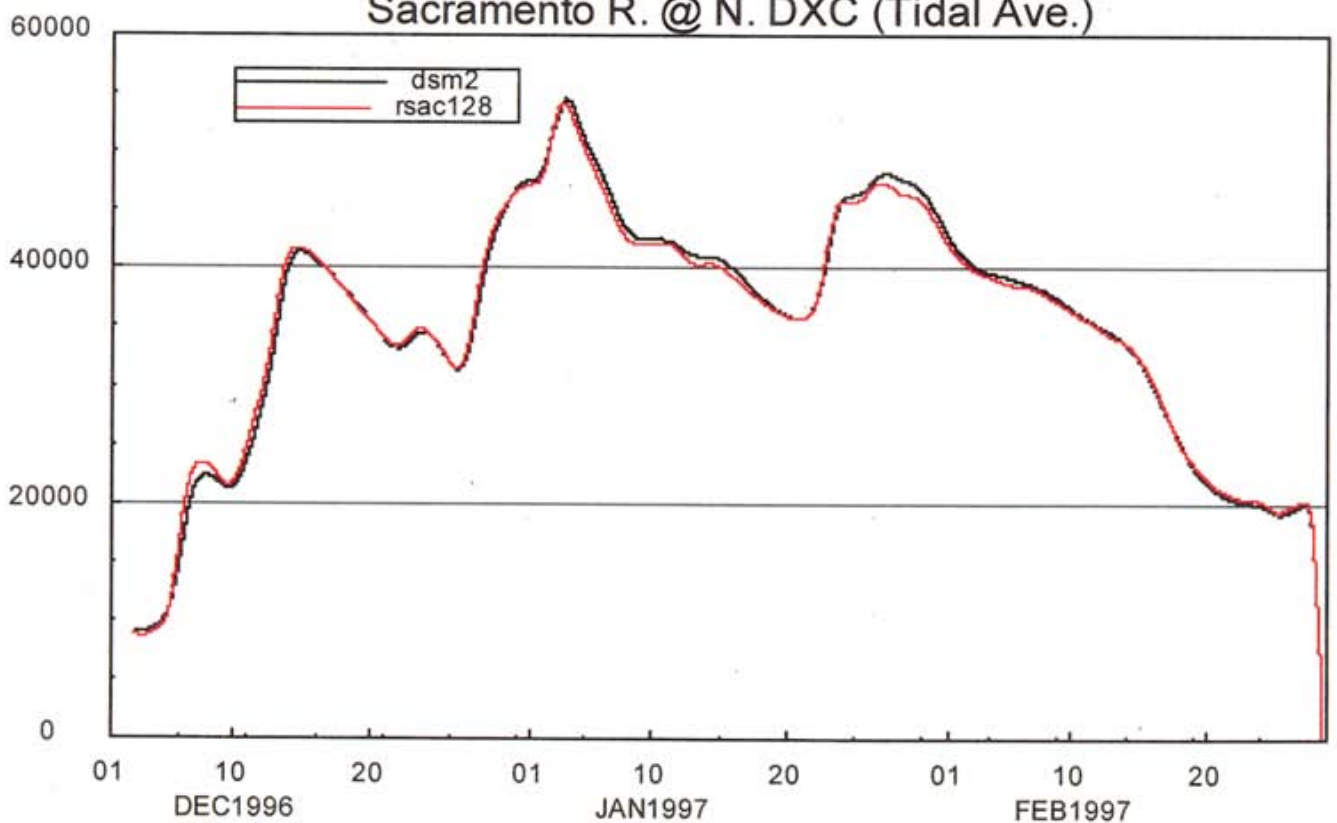


Flood-SJR Flow Calibration

Middle R. @ Middle R. (Tidal Ave.)

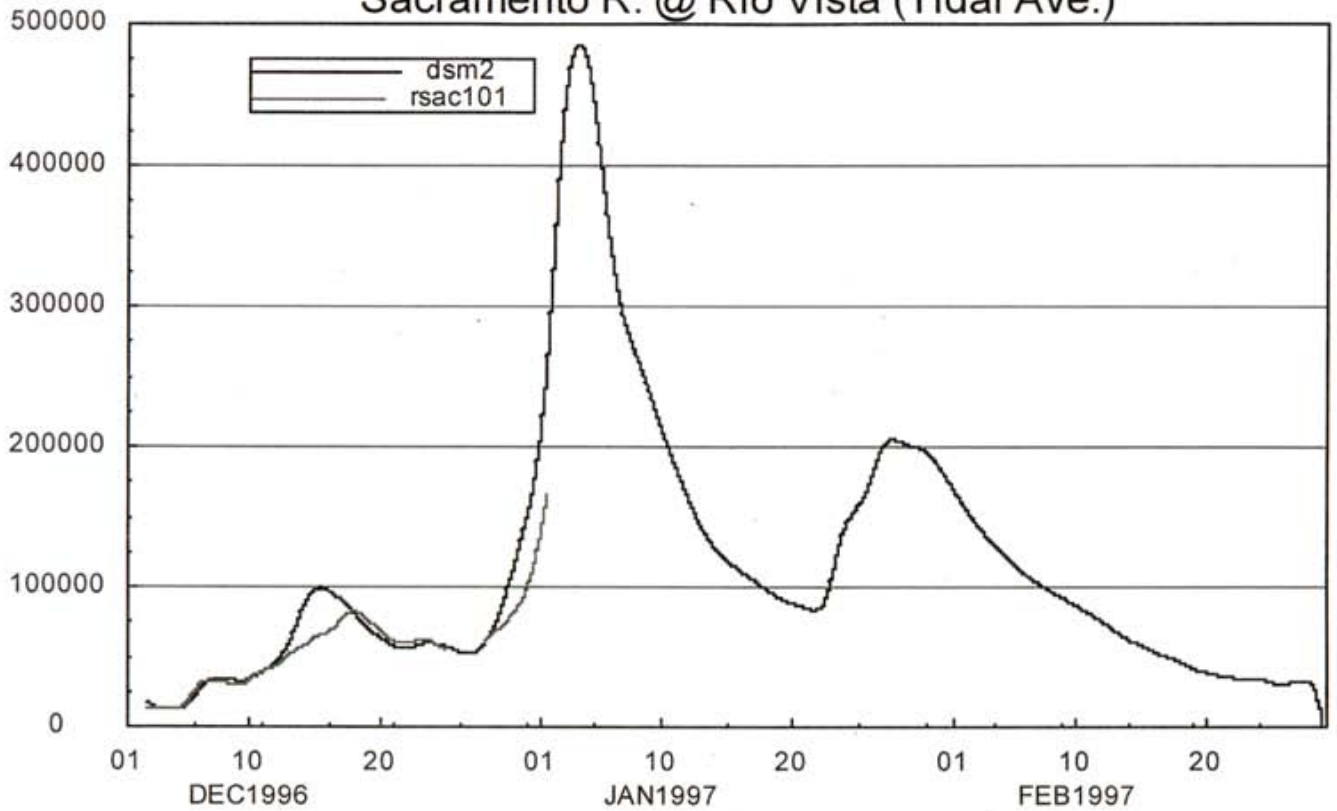


Sacramento R. @ N. DXC (Tidal Ave.)



Flood-SJR Flow Calibration

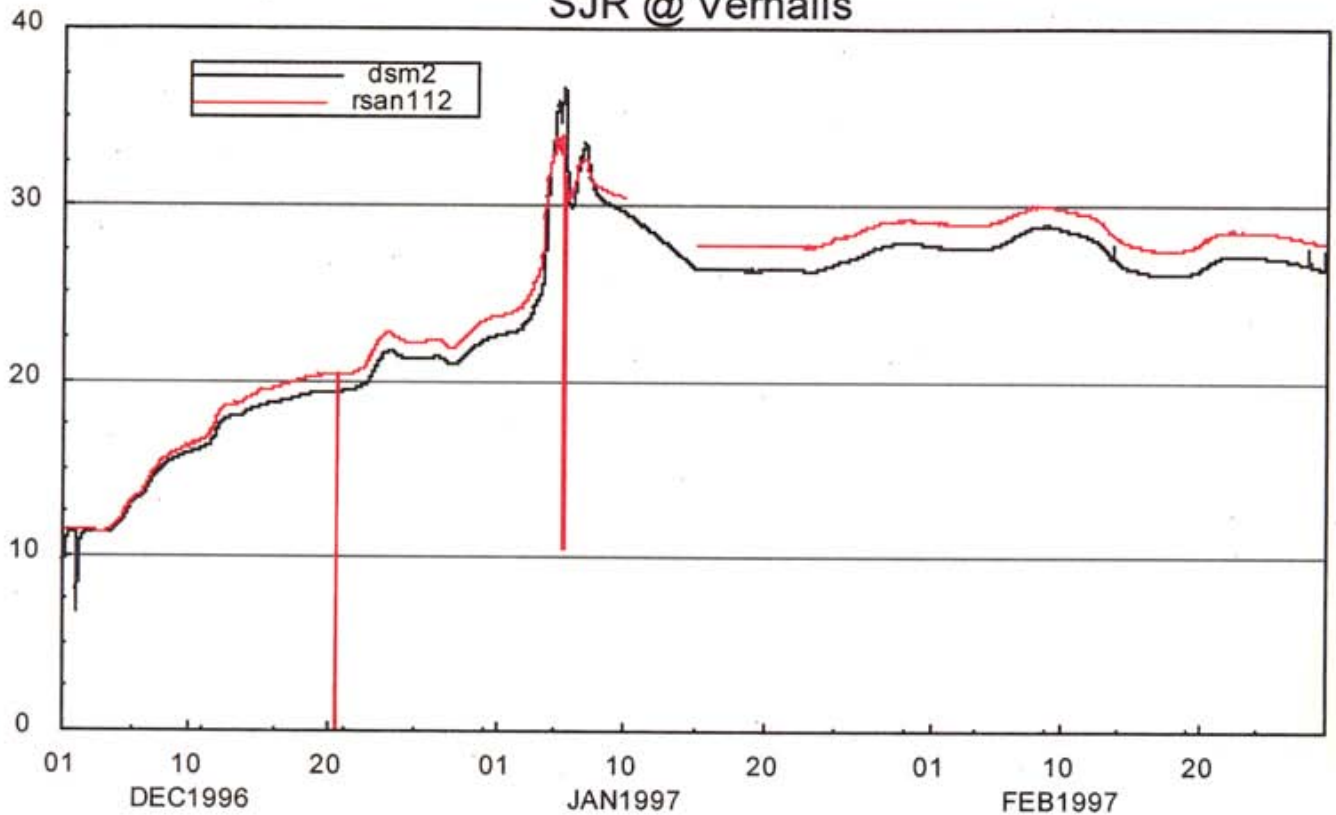
Sacramento R. @ Rio Vista (Tidal Ave.)



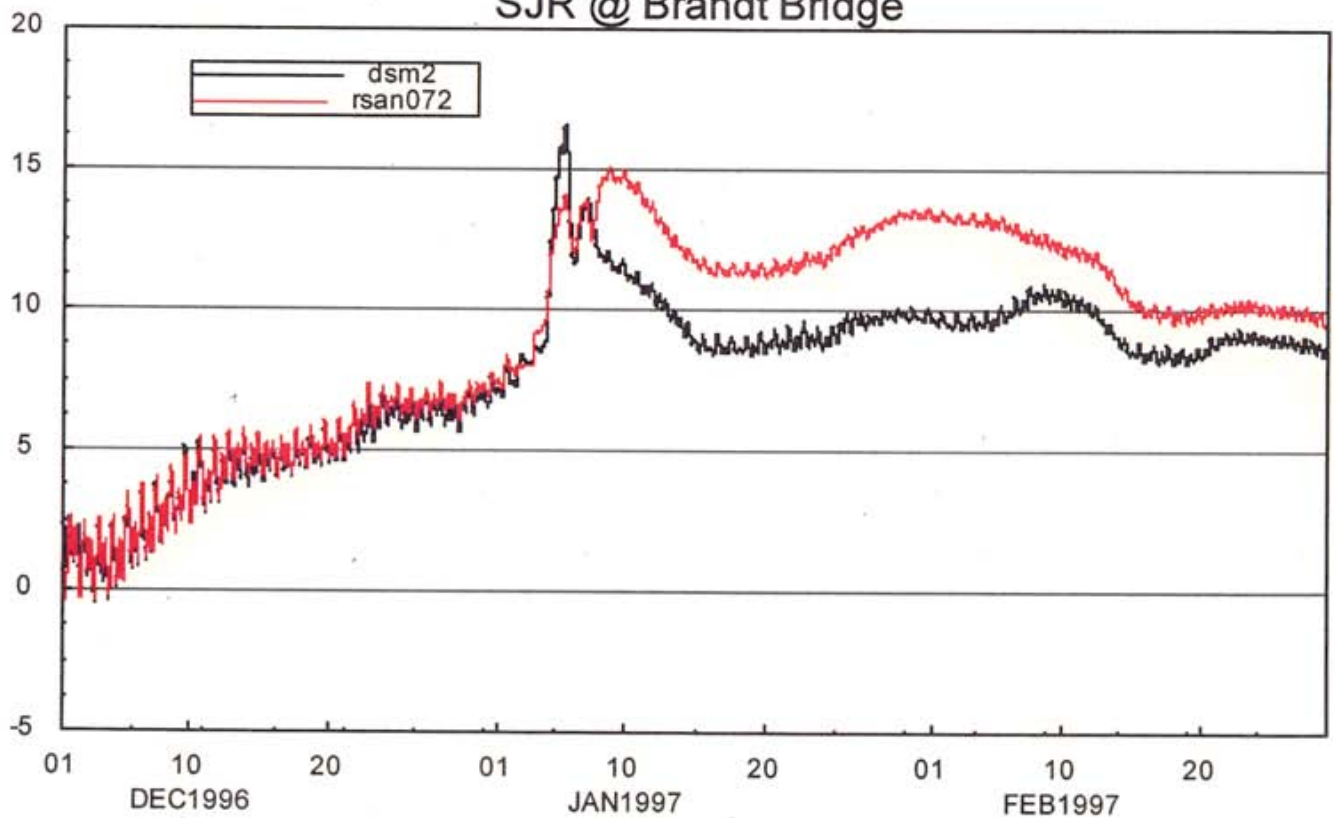
Model run using unadjusted Vernalis Flow

Flood-SJR Stage Calibration

SJR @ Vernalis

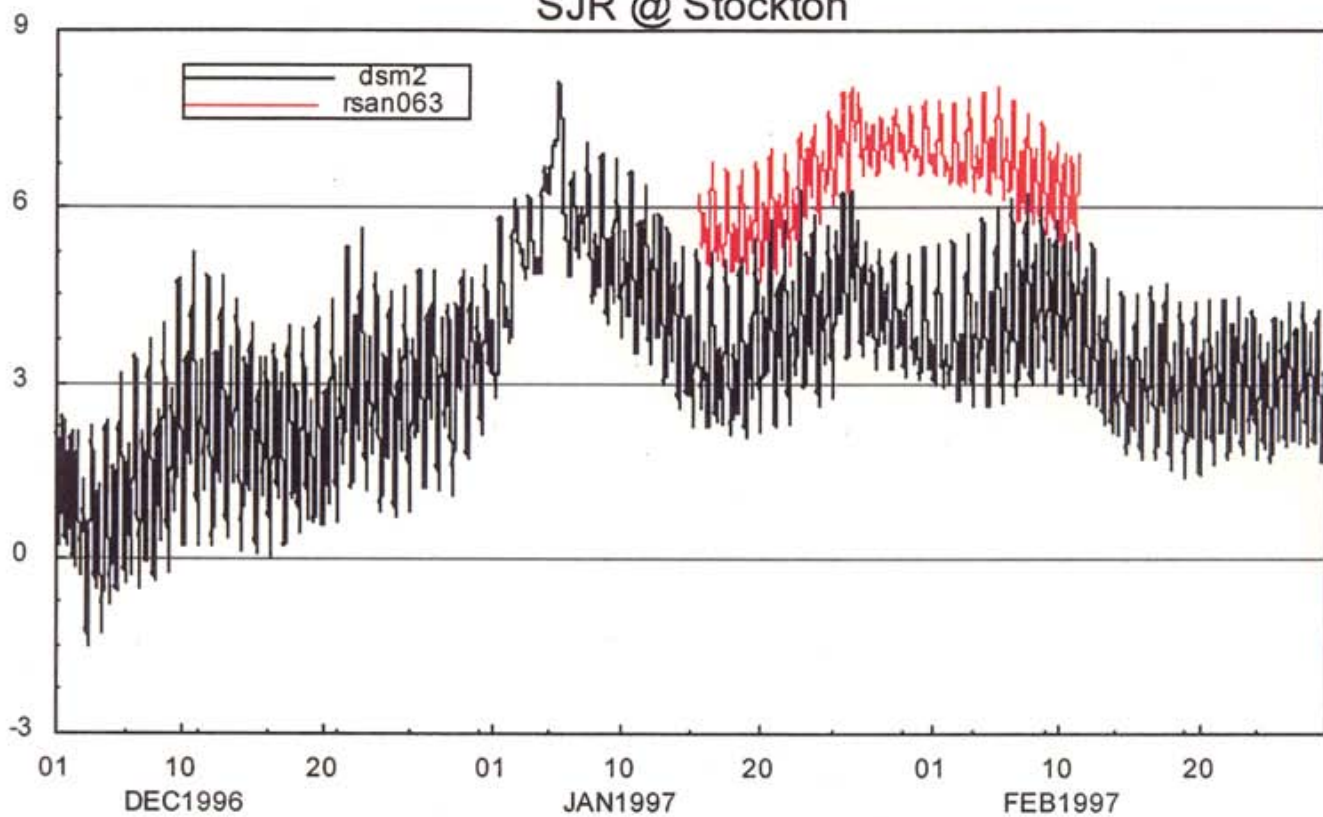


SJR @ Brandt Bridge

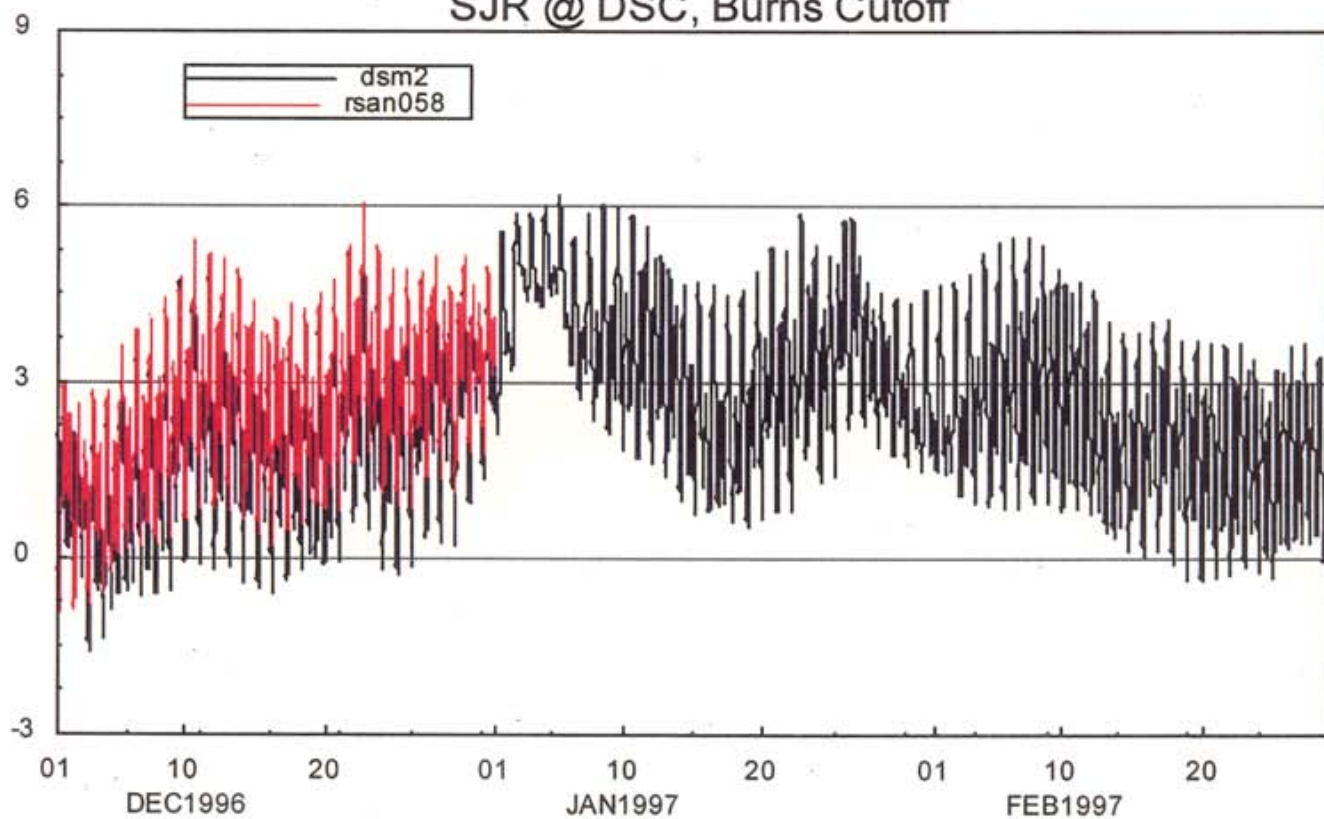


Flood-SJR Stage Calibration

SJR @ Stockton

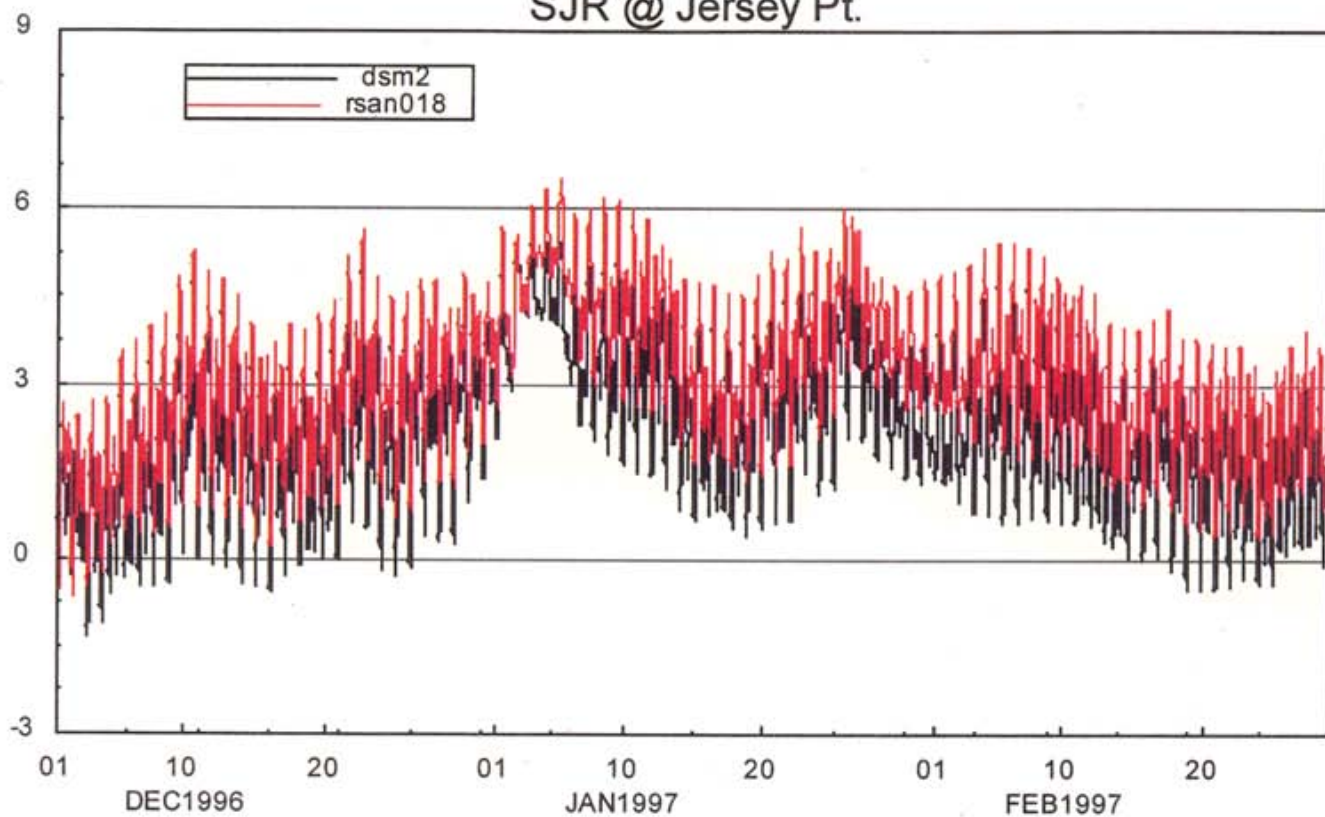


SJR @ DSC, Burns Cutoff

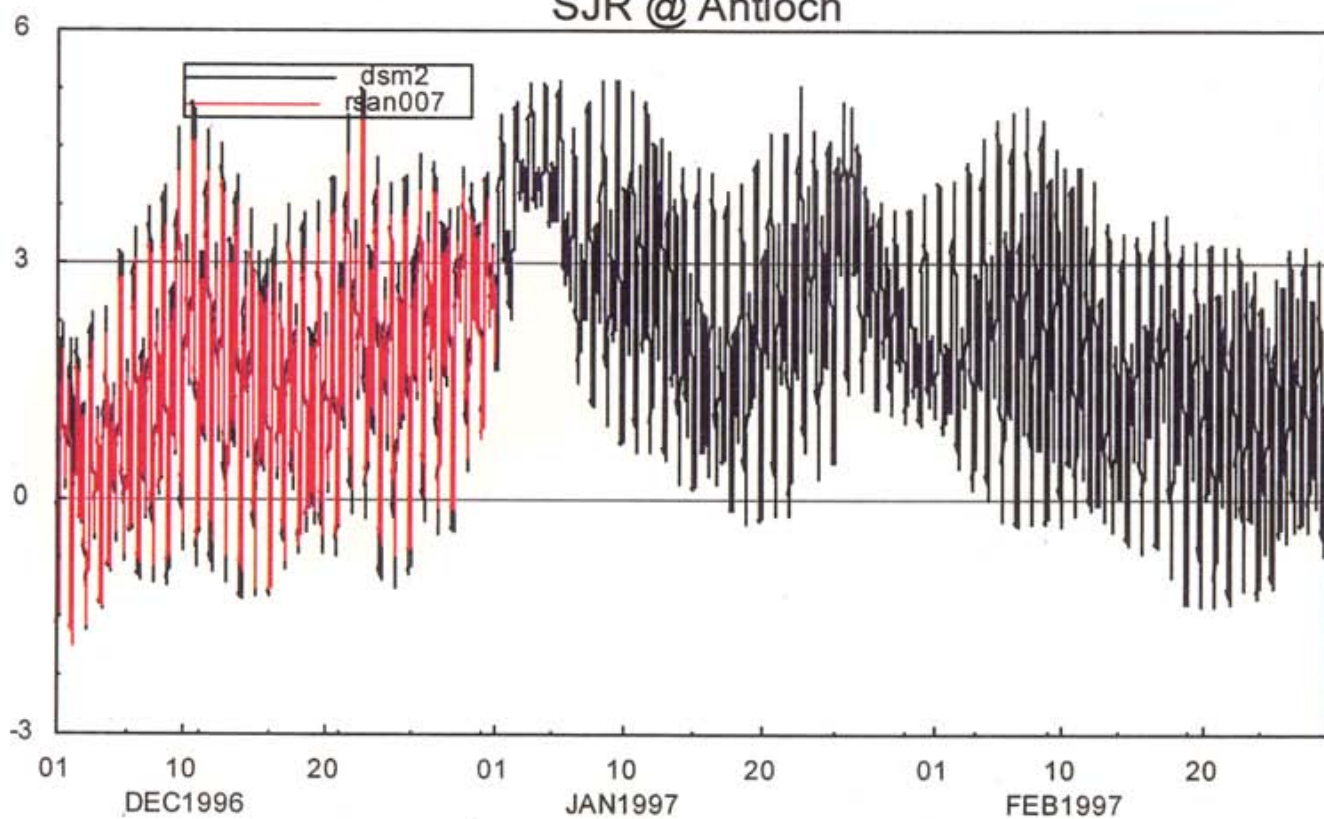


Flood-SJR Stage Calibration

SJR @ Jersey Pt.

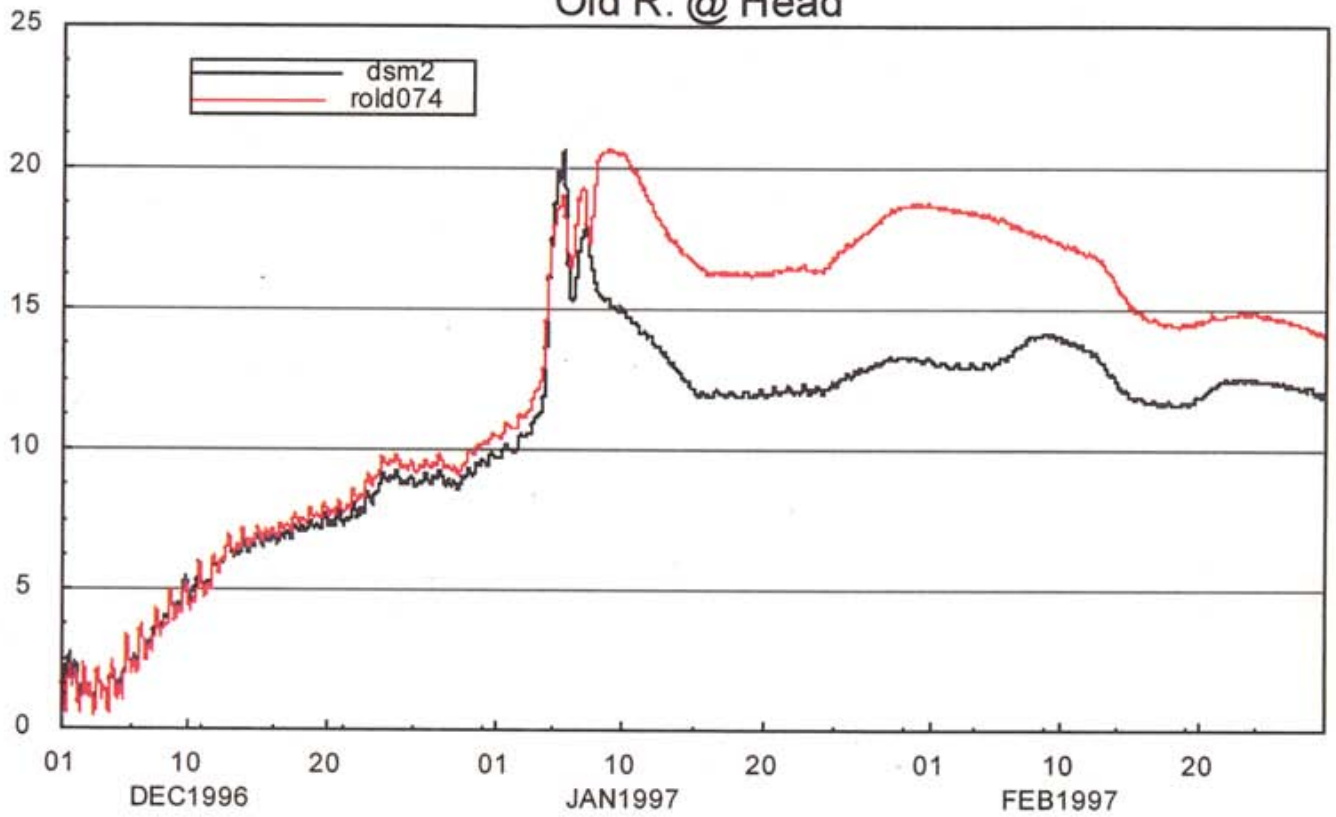


SJR @ Antioch

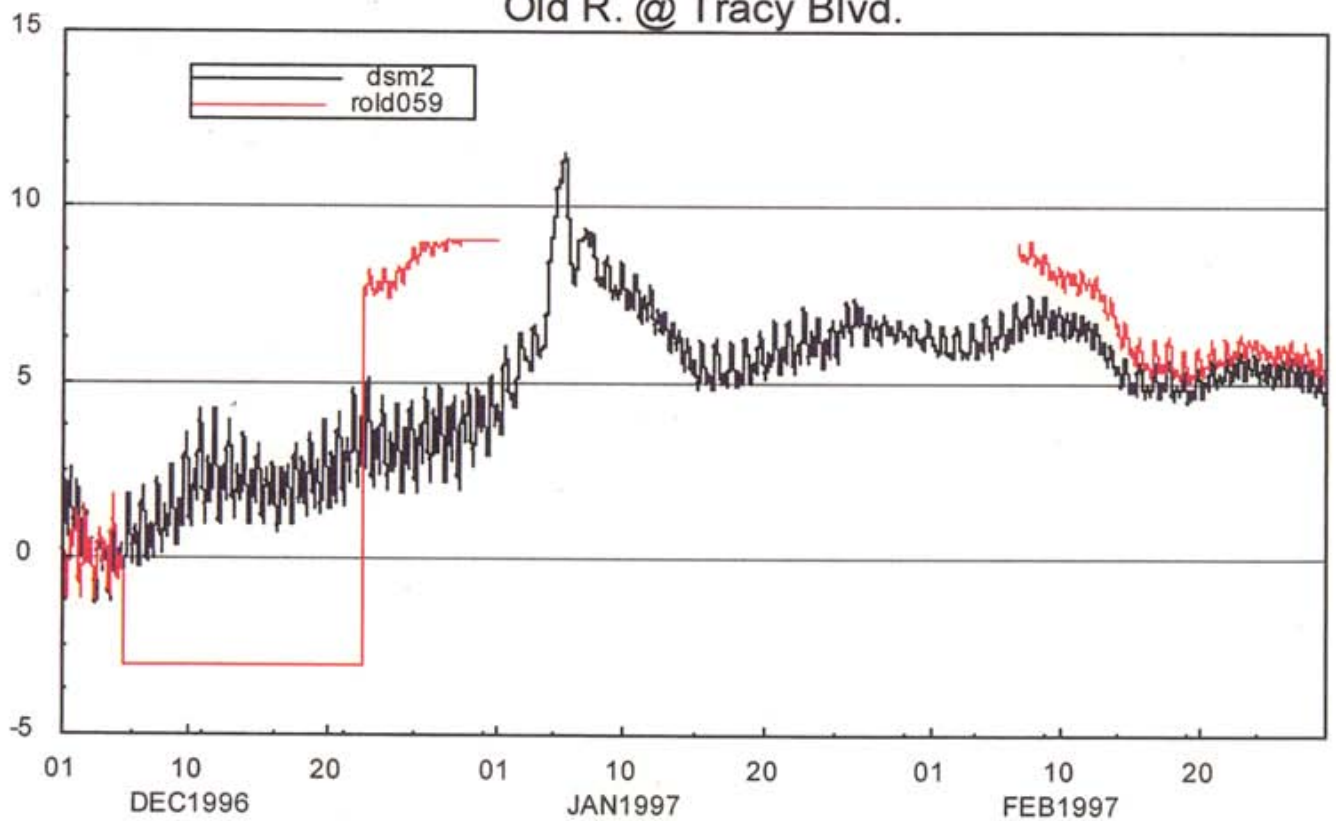


Flood-SJR Stage Calibration

Old R. @ Head

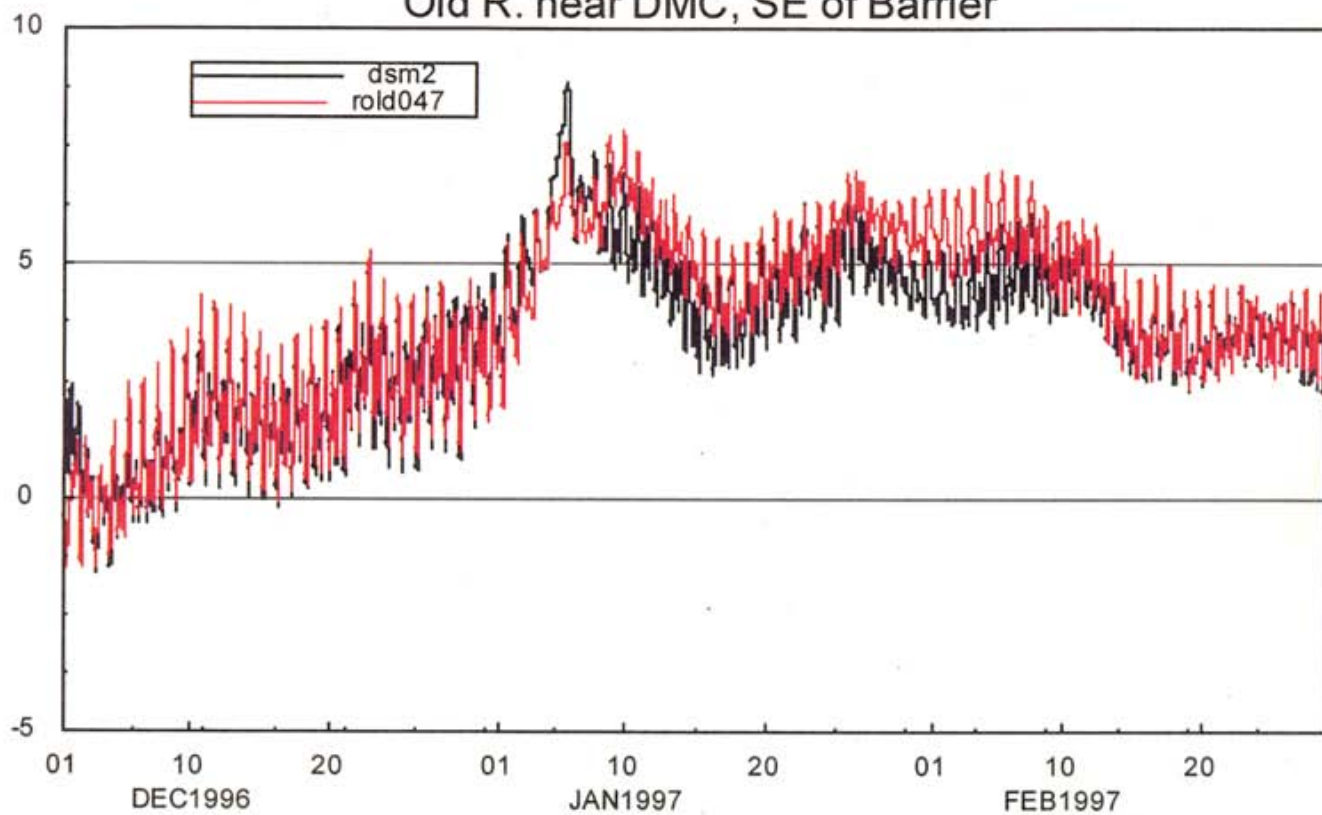


Old R. @ Tracy Blvd.

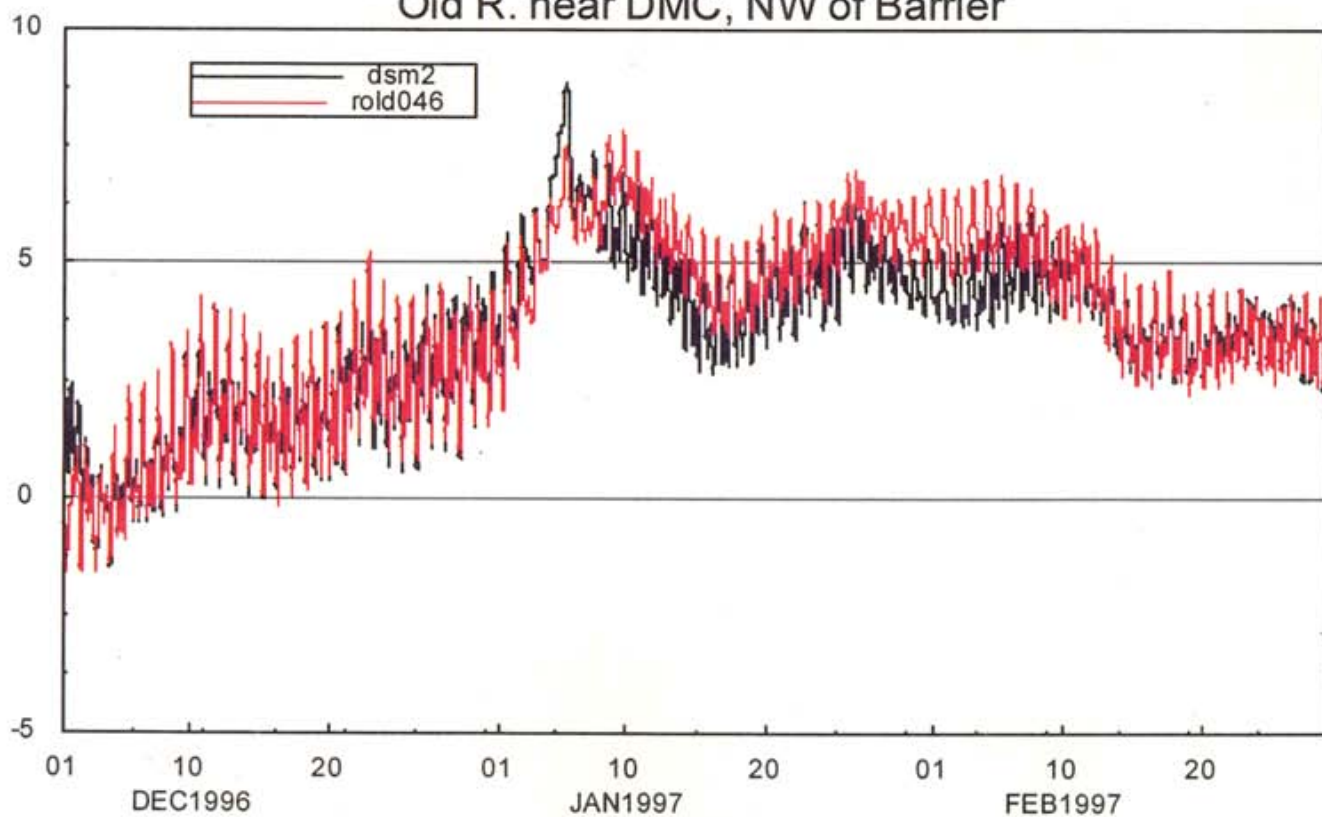


Flood-SJR Stage Calibration

Old R. near DMC, SE of Barrier

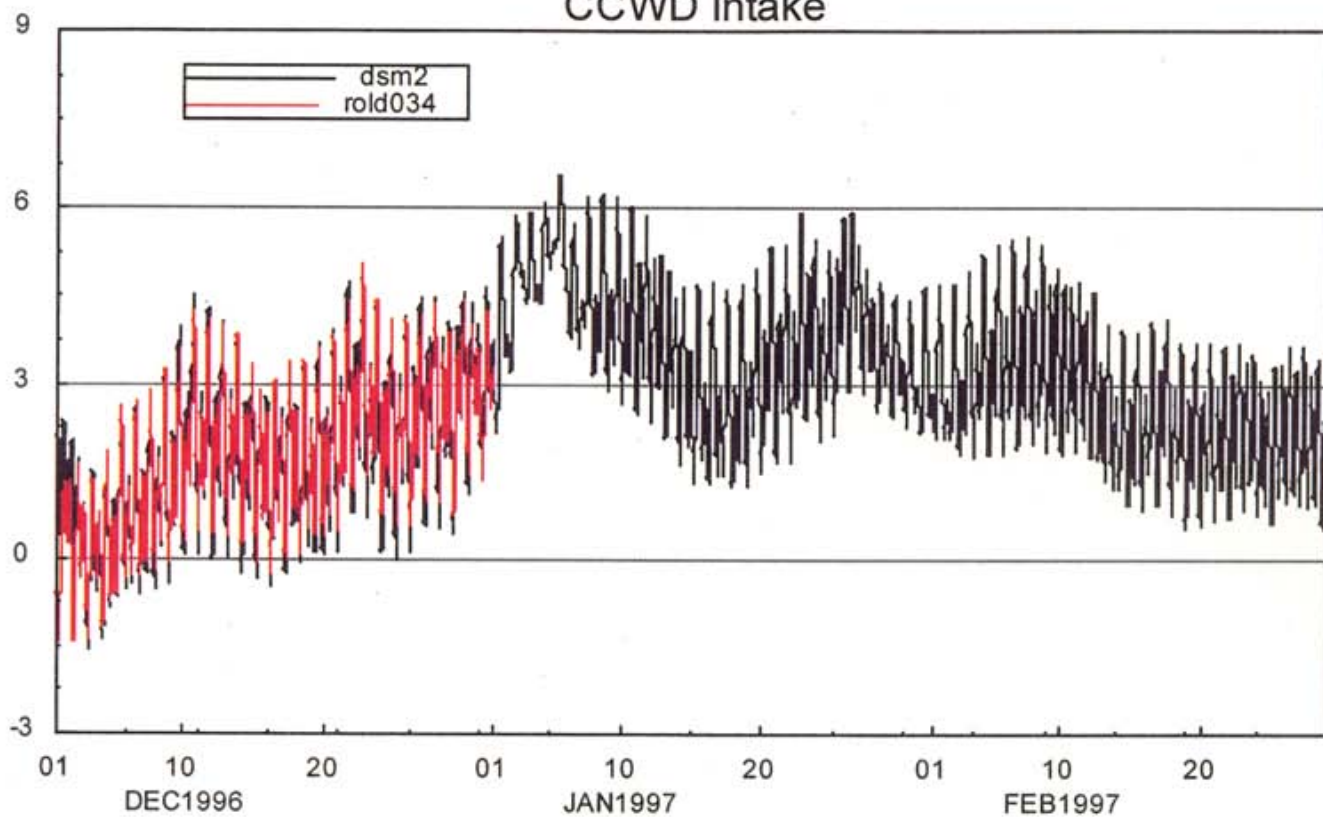


Old R. near DMC, NW of Barrier

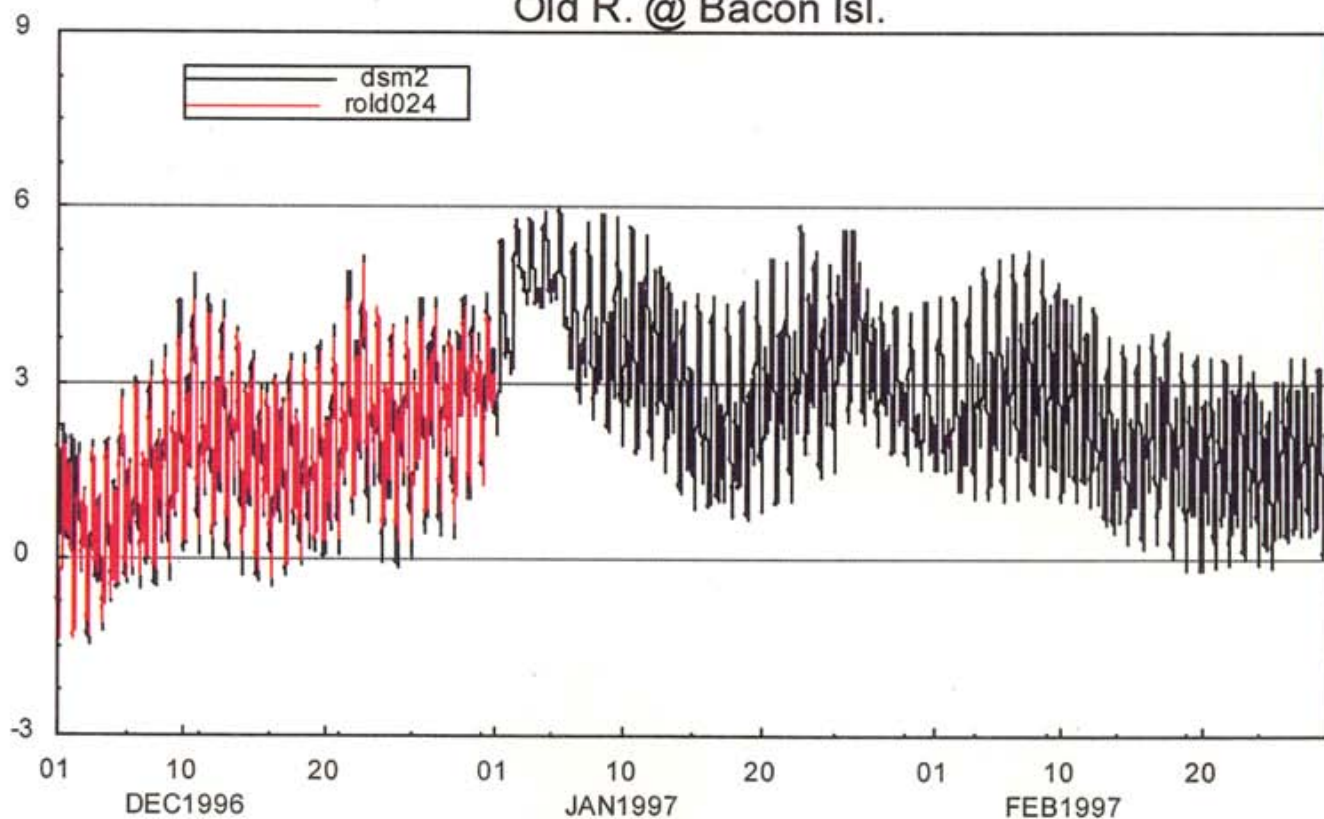


Flood-SJR Stage Calibration

CCWD Intake

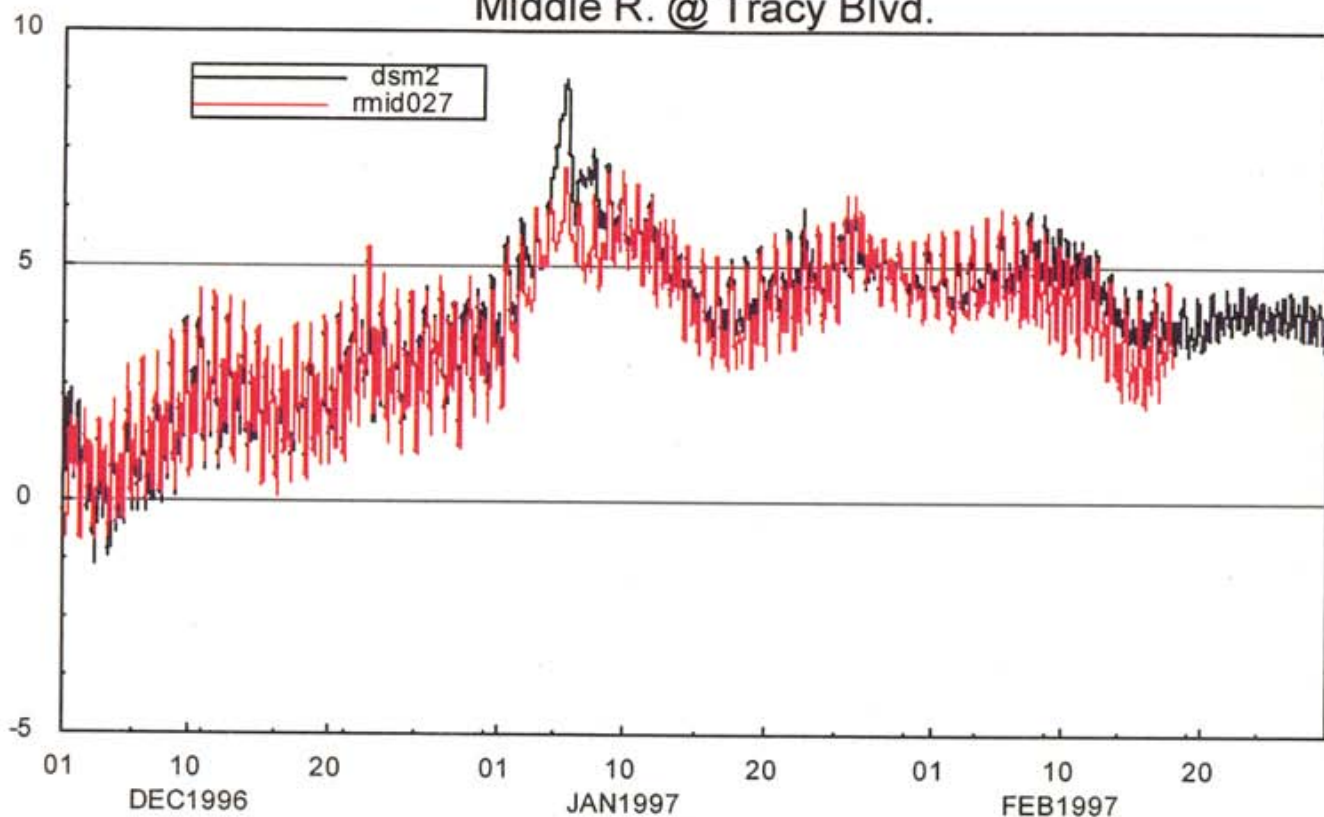


Old R. @ Bacon Isl.

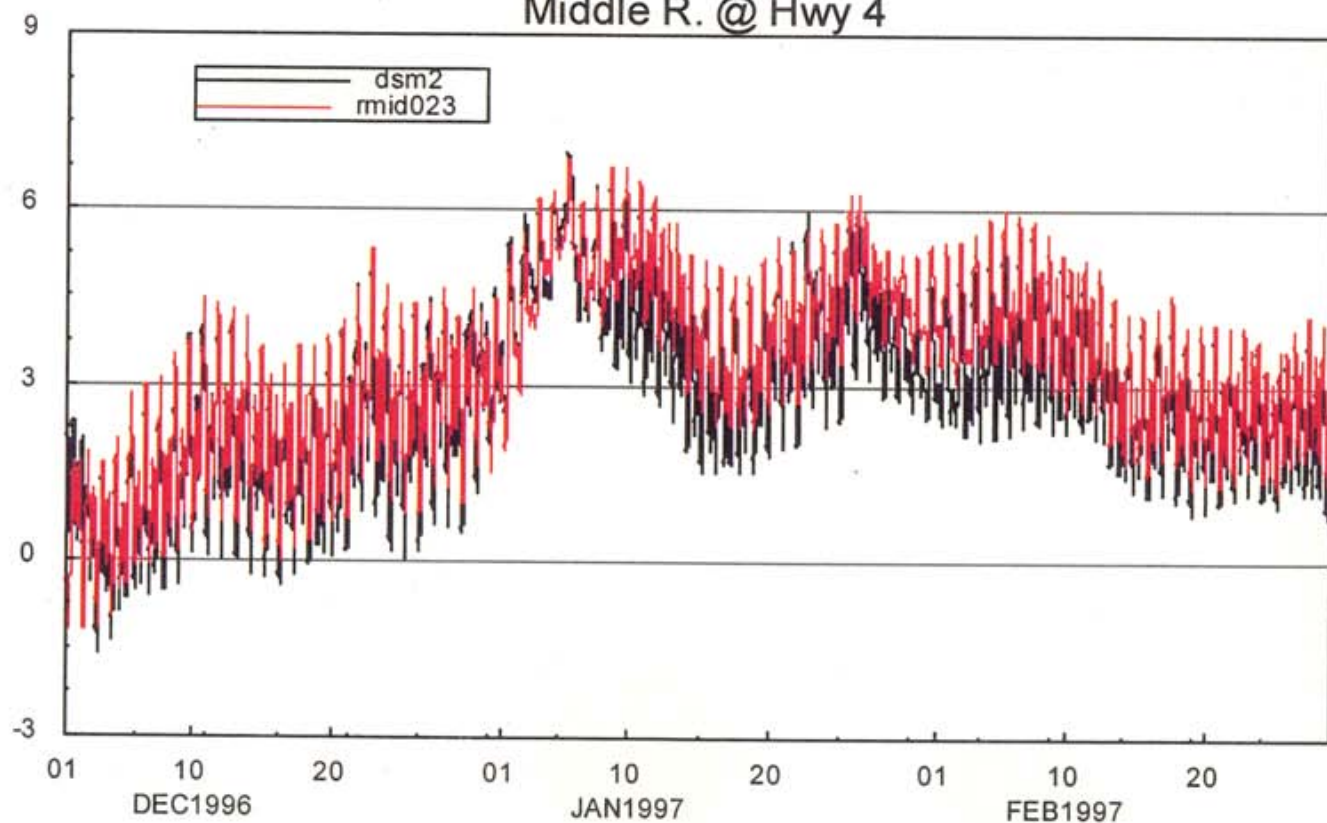


Flood-SJR Stage Calibration

Middle R. @ Tracy Blvd.

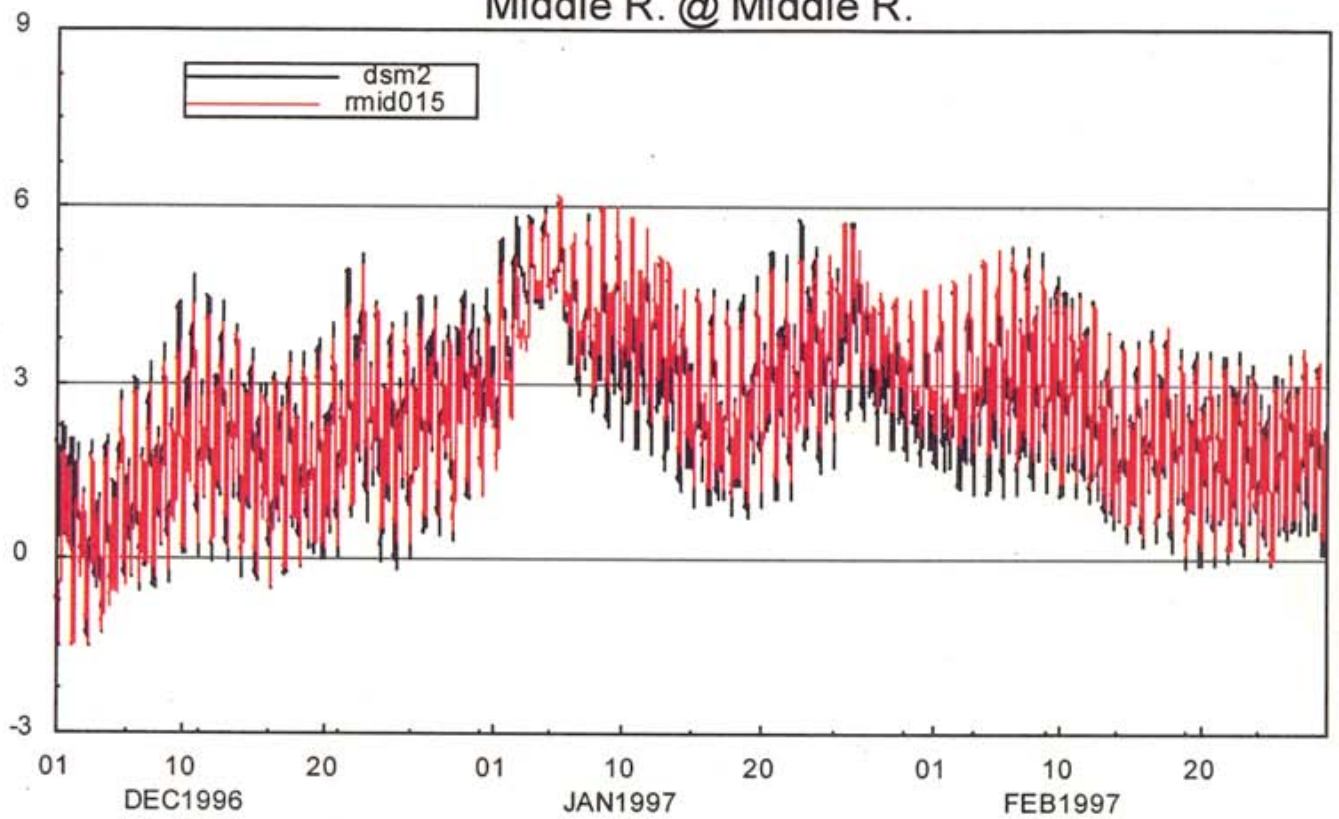


Middle R. @ Hwy 4

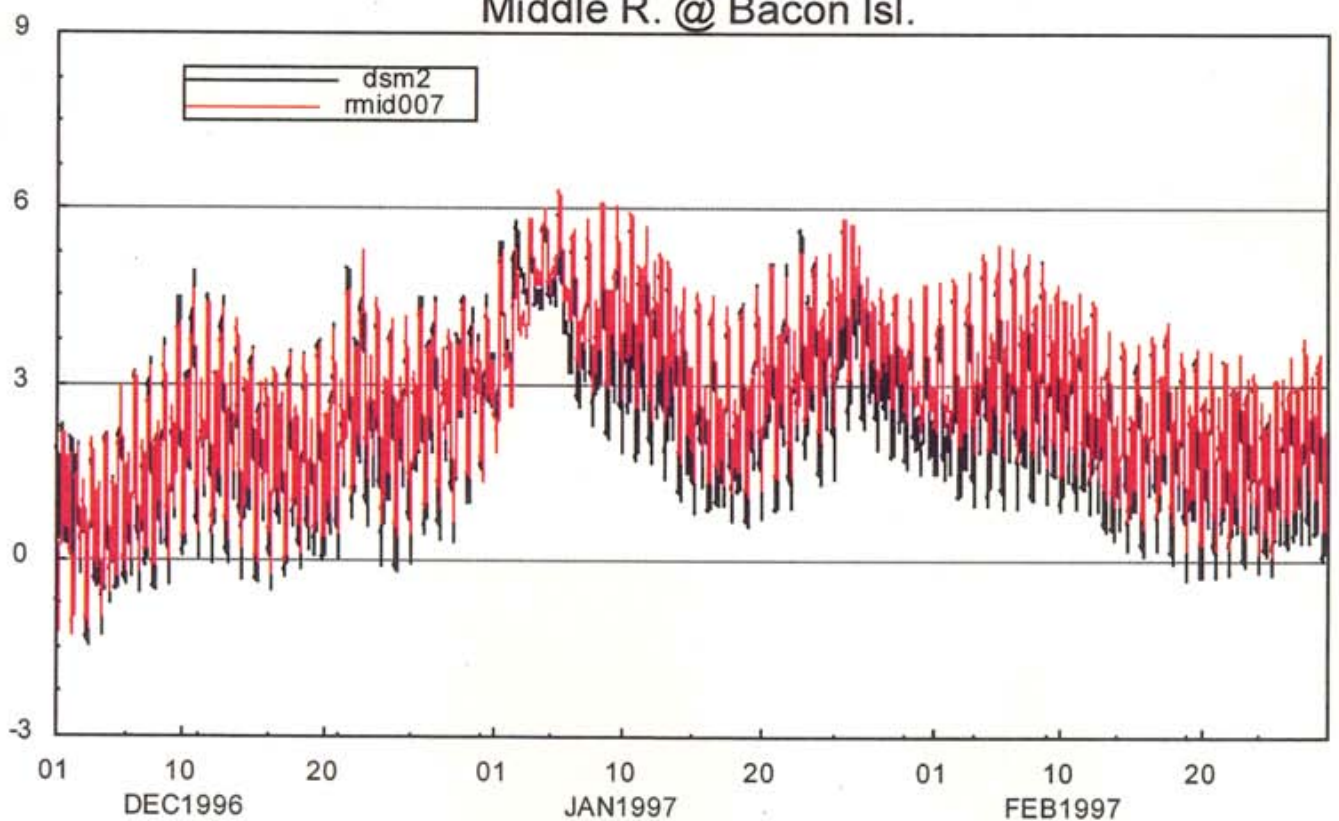


Flood-SJR Stage Calibration

Middle R. @ Middle R.

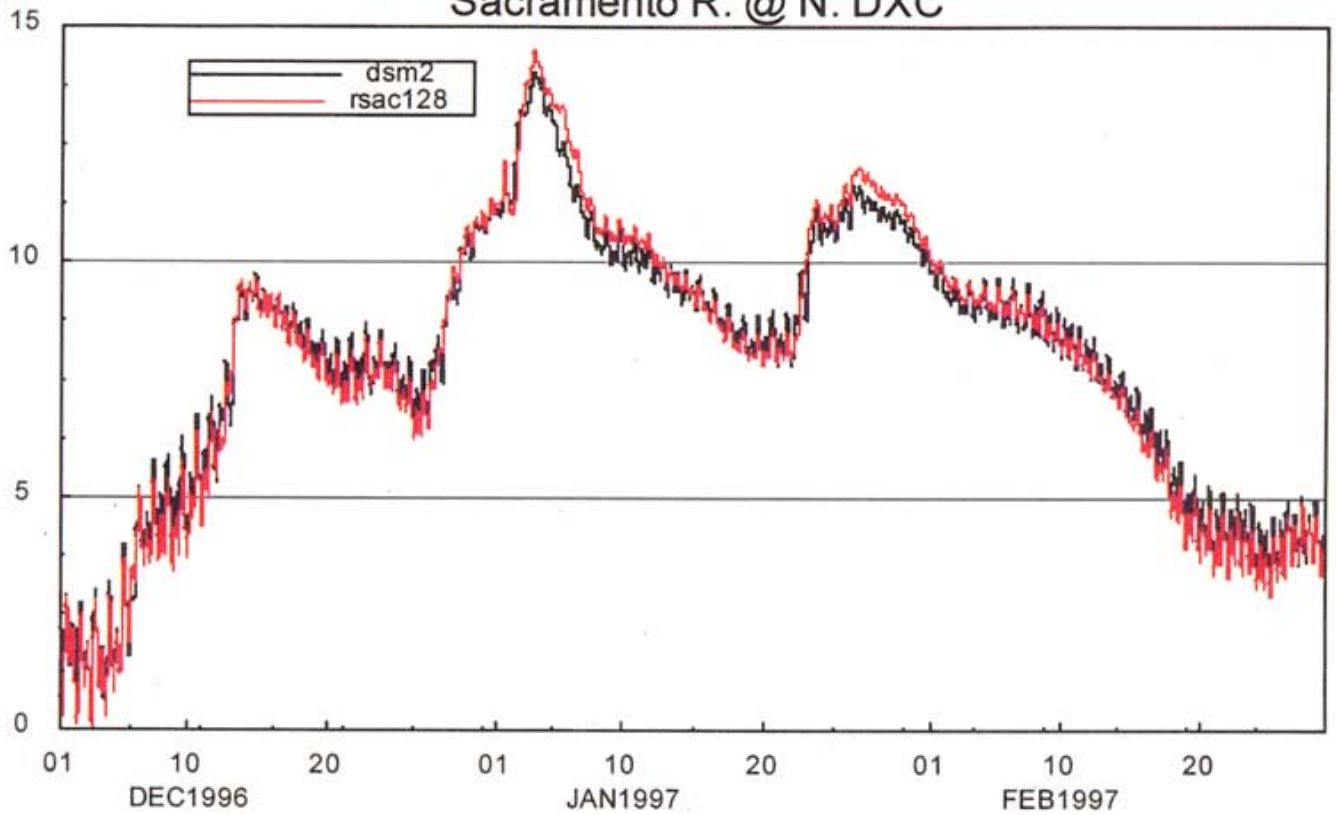


Middle R. @ Bacon Isl.

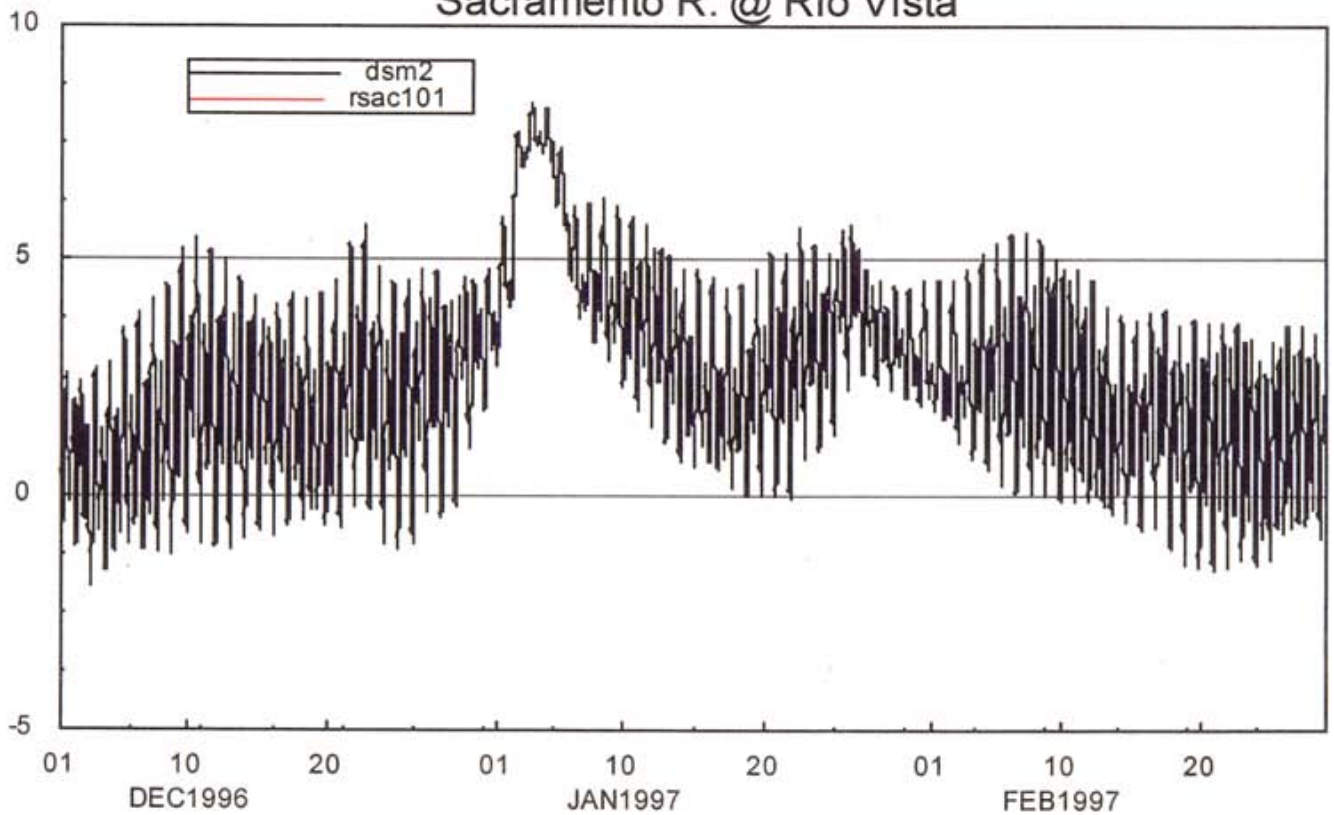


Flood-SJR Stage Calibration

Sacramento R. @ N. DXC

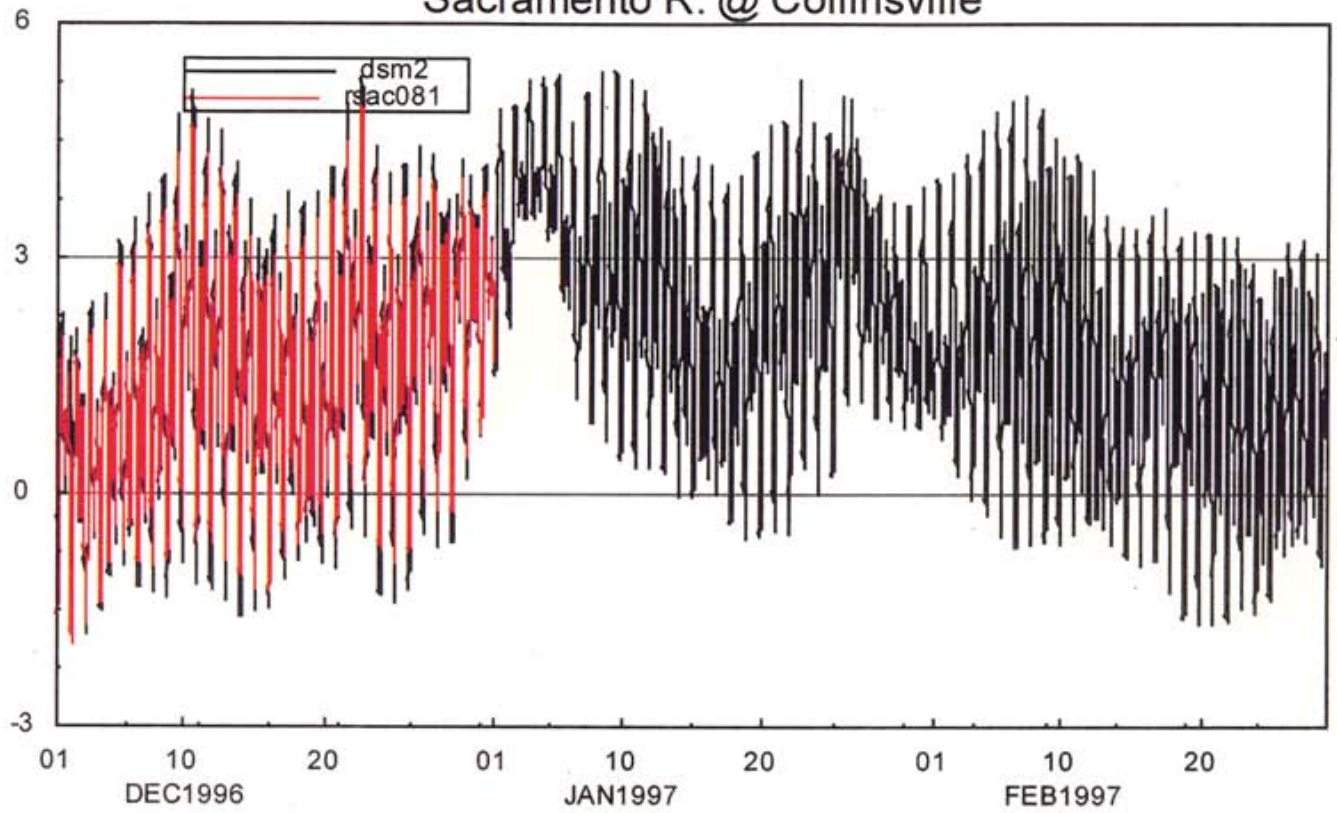


Sacramento R. @ Rio Vista



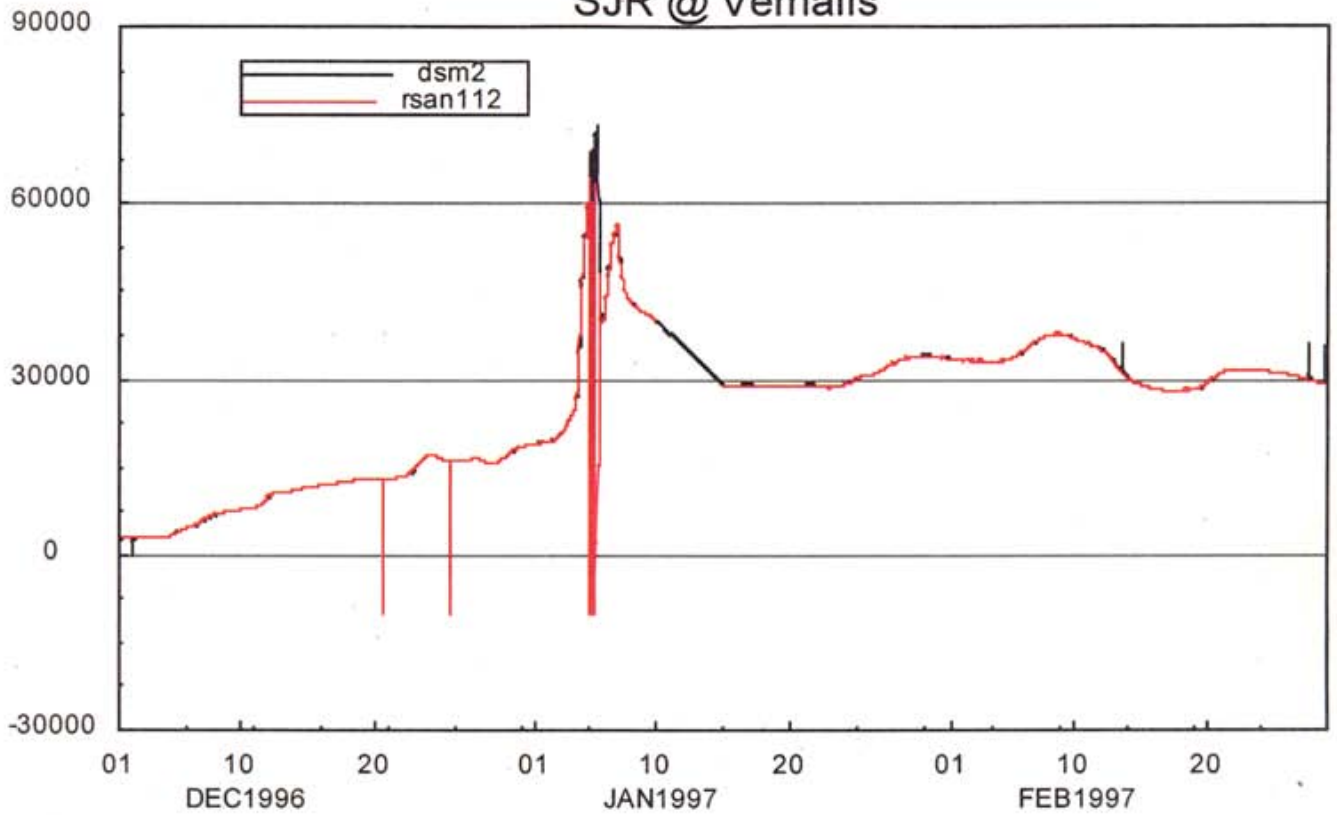
Flood-SJR Stage Calibration

Sacramento R. @ Collinsville

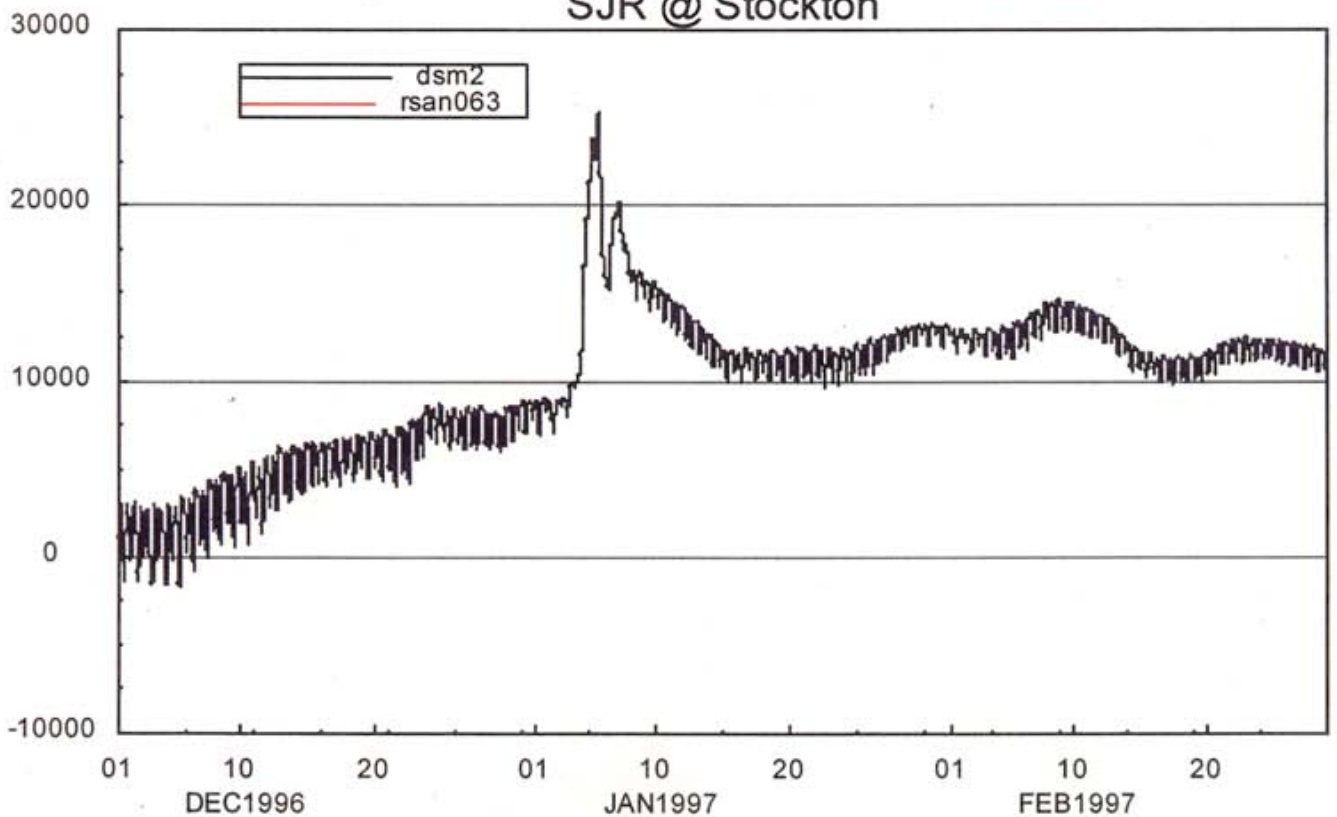


Flood-SJR Flow Calibration

SJR @ Vernalis

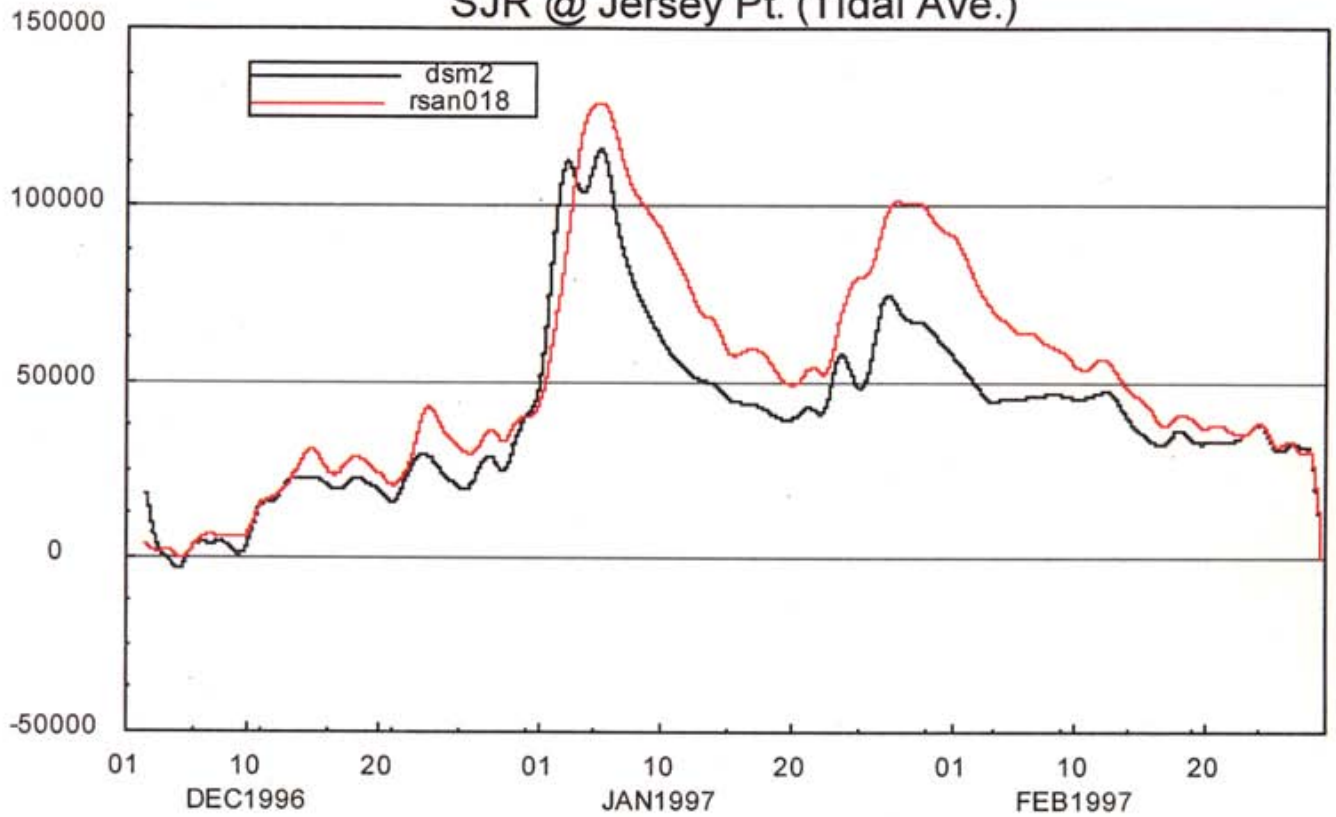


SJR @ Stockton

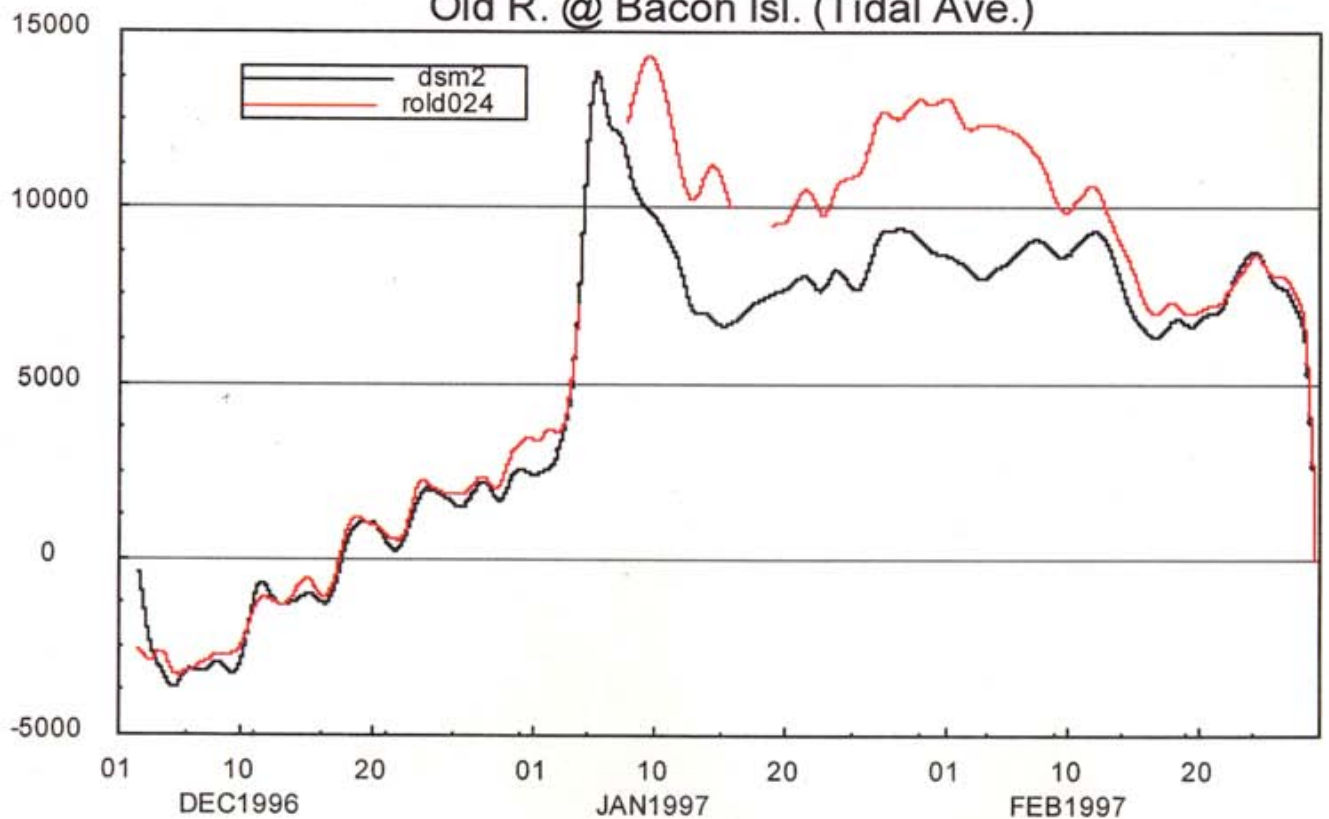


Flood-SJR Flow Calibration

SJR @ Jersey Pt. (Tidal Ave.)

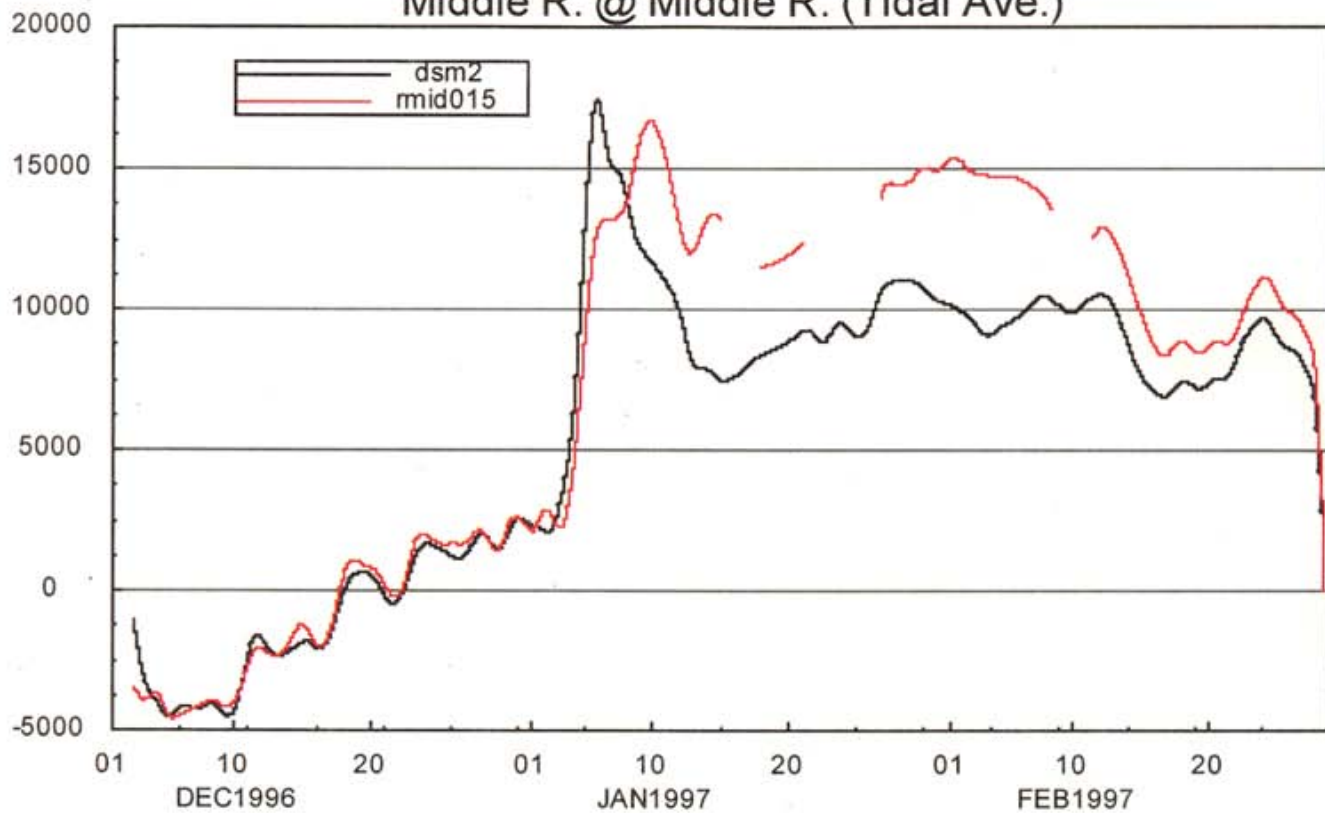


Old R. @ Bacon Isl. (Tidal Ave.)

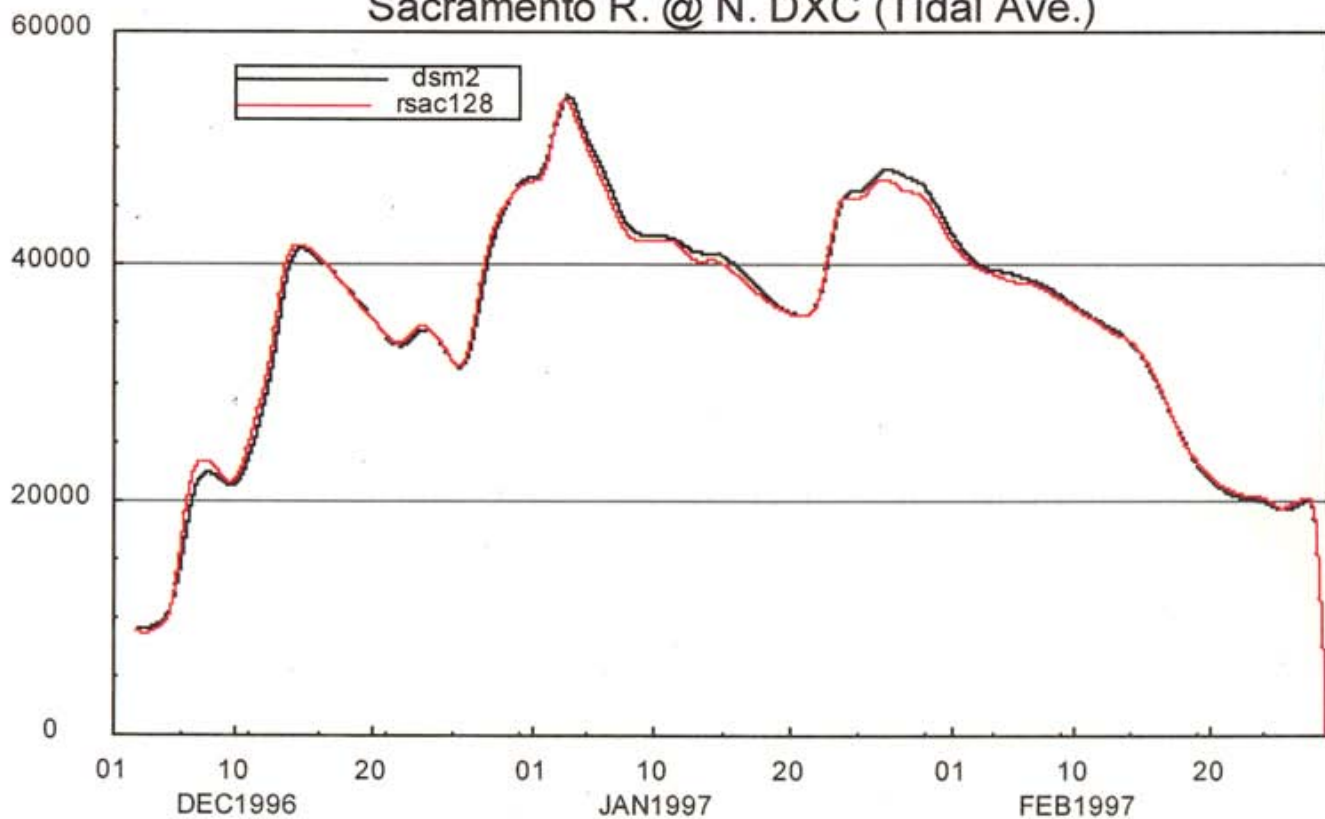


Flood-SJR Flow Calibration

Middle R. @ Middle R. (Tidal Ave.)



Sacramento R. @ N. DXC (Tidal Ave.)



Flood-SJR Flow Calibration

Sacramento R. @ Rio Vista (Tidal Ave.)

